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THE AMERICAN FARMER:

DEVOTED TO
Agriculture, Horticulture, and Rural Economy.

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"AGRICOLAS." *Virg.*

Sixth Series. BALTIMORE, NOVEMBER, 1869. Vol. IV.—No. 5.

NOVEMBER.

"Tis a few sunny days, in which the bee
Shall murmur by the hedge that skirts the way,
The cricket chirp upon the russet lea,
And man delight to linger in the ray.
Yet see rich smile, and we will try to bear
The piercing winter frost, and winds, and darkened air."

Work for the Month.

FALL PLOUGHING.

Fall ploughing of turf land, is, at least, often a matter of convenience, inasmuch as the work is done when the team is strong, the weather temperate and the ground in the best condition for breaking; at the same time the work of preparation for spring planting is put forward, and great advantage is got in the case of a rainy spring season. It is often urged, too, that there is great benefit derived from the action of frost on the more clayey soils especially, and no doubt there is; yet on the whole, and for the generality of soils, it is doubtful whether there is any advantage, but the contrary rather, except so far as it forwards the spring work.

THE WHEAT FIELD.

Leave the fields of small grain in the best condition to get rid of surplus water. Let furrows be carefully opened wherever they may be needed, with free vent for the water. Winter-killing is mainly the effect of too much moisture, and an excess may be gotten rid of usually by well laid furrows, kept well open.

TOBACCO.

The tobacco in the house should not be exposed to high winds or bad weather, but the houses should be kept closed except during sunny days. The stripping should not begin till the leaf-stems are well cured.

CORN CROP.

Let the corn be now gathered from the fields and put under lock and key as early as practicable. While there is, no doubt, economy of labour in husking at once in the field, we prefer, where it can be done, to make all despatch in getting the crop from the field and out of the reach of depredation, where it may be husked at leisure. In this manner it will be better cured for the crib and less liable to heat and mould. The shucks, too, are consumed more economically, if preserved separately and fed separate from the leaf fodder.

The fodder being well secured against damage by weather, should be fed out in the early part of the feeding season, to give the opportunity of all the time and trampling possible, to prepare them for use. The sooner they are broken, too, the more efficient they become as absorbents of the moisture of the manure heap. A portion of blades, if they have been saved separately, should be kept for the working and driving horses in spring and summer. It should be borne in mind that no animal can do full work on the green food of the summer, and for all, of which it may be required, the very best long provender should be reserved. Nothing is better than well cured corn blades. The tops are very suitable for sheep and calves, and the shucks for oxen.

Corn-fodder of every sort, well cured and taken care of, makes good winter food for milch-cows.

POTATO CROP.

The potato crop should now be promptly put out of the way of damage by freezing. Whether in kilns or cellar, dry off the moisture before putting them away. They can be well preserved out of doors, and on the surface of a dry spot, if sufficiently covered with earth and straw. This covering should be comparatively light at first, and increased when hard frosts begin to set in. Guard carefully against the entrance of water.

RUTA BAGA AND OTHER ROOTS.

All these crops should be taken from the ground now and put into their winter quarters. They should be put convenient to the feeding places, and it is better, on the whole, to have them in kilns of forty or fifty bushels than in bulk in a cellar.

HOG FEEDING.

The hogs penned for slaughter should be now accustomed to the change of food, and should be fed to the limit of their appetite. Let them be encouraged to eat as much as they will of the best food you can give them, and keep them quiet and comfortable. Give frequently charcoal or pieces of rotten wood, which they will consume greedily. Give also occasionally a handful of salt and ashes to each hog.

When it is practicable, the economy of cooking or grinding, or both, should be practised. There is no room to doubt, after the many experiments made, that the same food will make much more meat if thus prepared.

Hogs fatten faster on floors removed from the ground, and a few together in close pens, than under other circumstances, but we much prefer to have them feed a little less economically on the ground, and where they can enjoy a small pasture lot and a running stream of pure water.

CATTLE FEEDING.

Feeding beeves for the butcher should be regularly and systematically carried on, avoiding excessive feeding, which injures the appetite. If in the early period of their feeding they are fed too high, they will lose appetite and lose time, and there will be waste of condition before they can be thoroughly restored. Keep them always dry and comfortable, and

let them have fresh water always at hand or often supplied.

These remarks are alike applicable to sheep that are being fed for the butcher. Protect them especially against long cold rains during the time of fattening, keep them off the wet ground at night and make them, in all respects, thoroughly comfortable.

STORE STOCK.

All stock to be kept over winter should be provided for in such manner as to insure their health and comfort. The quality of their food may be inferior to that of the fattening stock, and they may have more liberty of moving about in good weather. The object is to maintain health and vigor, rather than to make fat. Let them have at least the protection of good sheds, and be kept out of muddy roads and yards.

The Vegetable Garden.

NOVEMBER.

Asparagus.—Clear off the stalks and burn them, to prevent the scattering of the seed. Destroy all weeds, and give a thick dressing of old farm-yard manure, to lie all winter.

Brussels Sprouts.—If this vegetable is grown, where the heads are cut out, the dead leaves should be removed, but the green ones left as a protection to the tender side shoots.

Cauliflowers.—Plants now heading and not wanted for immediate use, may be taken out and hung up in the cellar, where they will keep for some weeks. Those under glass should have air daily except in hard freezing weather.

Cabbage.—In open weather draw the earth occasionally to the cabbage plants that are set out.

Celery.—Bank up the earth on the celery when dry. Make ridges as narrow as practicable at the top, and beat them smooth, that they may shed the water. A dressing of unslaked lime, with the earth banked around the plants, is said to preserve them from rotting and also prevent their being eaten by the slugs.

Endive.—This winter salad, if taken up and planted in a frame, will give good heads from Christmas to early spring. Give plenty of air in good weather.

Lettuce.—The cabbage kinds planted in

frames for winter use, will not require much air, if the soil be light and dry.

Potatoes.—Whenever the weather suits, the ground intended for early potatoes should be roughly forked or ploughed over. It is better to apply manure now than when they are planted.

Rhubarb.—Some good manure should be laid over the crowns of the plants, to protect them from frost.

Spinach.—In picking leaves, be careful to tread the ground as little as possible.

Clear up all decaying waste matter and litter, stir the surface among all growing plants, and plough or spade, when convenient, ground to be planted in early spring.

The Flower Garden.

Continue to clear the flower garden of such plants as have become unsightly. Spade the beds and do such other work as will save time in spring.

Additions to stock of plants should be made now, rather than in spring, when florists' stocks have been picked over. Protect them in a frame or otherwise till May.

Ground to be prepared for Roses should be trenched two feet deep, and heavily dressed with well rotted manure, incorporated to the full depth of the soil.

Protect at once all tender shrubs, tea and other hardy Roses. A little straw, or branches of cedar or pine bound around them and fastened to a stake, will protect them.

Take up, and put in a place of safety, roots of Dahlias.

Continue to remove, divide and plant out, in mild weather, hardy shrubs and trees.

Look over house plants and remove all decayed leaves, and stir the surface soil.

The Fruit Garden.

Continue necessary pruning in all fine weather, postponing other work, if necessary, in order to finish this before settled cold.—One must be used in taking out large branches. Keep the middle of the tree open to sun and by judicious thinning.

Continue to plant in good weather, but finish as early as practicable. Spread roots out well on thoroughly broken soil, and give wheelbarrow full of rich mould to each tree.

Make preparation for continued planting in spring, by draining, ploughing, subsoiling and pulverizing the ground.

Newly planted trees should be mulched, as the mulch preserves the temperature and affords protection to the roots.

Remove all unnecessary layers from the strawberry beds and cover well with fine manure, which may be forked in in spring.

Raspberry plantations should be cleared of dead canes and superfluous wood, and suckers taken off.

Transplanting in Autumn.

The question is often asked, what is the best time in autumn to set out trees? Can we do it while the leaves are yet green, or wait till near winter, after they have fallen? The answer may be: Do it whenever the work can be well done, and when the soil is in proper condition as to dryness, for working properly. If done early, the leaves must be all first carefully stripped off, to prevent the rapid evaporation of moisture. We have known trees to have been entirely spoiled in a few hours by wilting, from carelessness in not removing the leaves when taken up.

In the Northern States, nurserymen usually commence digging by the first of October. Some trees have entirely ceased growing by this time, including generally cherries, plums and standard pears. If the leaves are removed, they may now be taken up and transplanted, as well as at any time in autumn or the following spring. Others have not fully completed the ripening of the young wood, which is effected through the assistance of the leaves. The only harm done in taking them up at this time, is in giving unmaturing shoots on some parts of the trees, instead of those well ripened and hardened; and the result will be that some of the tips may be nipped by the frosts of winter, or they will not start in the spring with so much certainty of vigor. Hardy kinds, such as the apple, will not be much injured in this way; and the peach, although tender, should be shortened back in spring in any case.

It will be safe, therefore, with a few exceptions, to take up trees any time after the first of October—care being taken to do the work well, as already indicated.

The soil should be in such condition as to be easily made fine and mellow, so that it may be filled in perfectly among the roots without

having interstices. Staking against wind, or effecting the same purpose by a small mound of earth about the stem, should not be omitted.

We have never succeeded better than by taking up trees about mid-autumn, heeling them in by burying the roots and half the stems for wintering, and setting out early in spring. They, however, do quite as well set out in autumn, provided they are hardy sorts and the site is not a windy one. In heeling in for winter, it is absolutely essential to fill in all the interstices among the roots very compactly with fine earth. Many trees are needlessly lost by carelessness in this particular. The roots are injured by dryness or mouldiness, and the mice find easy access among the cavities. To exclude mice effectually, the heeling ground should be clean and a smooth mound of earth raised on all sides about the trees.—*John J. Thomas.*

HOGS WANT SULPHUR.—Whether hogs require sulphur as an essential to their health, or whether it is sought by them as a condiment, may not be known for certainty. But one thing is sure, they devour it with greed whenever it is to be found. It is for this purpose, probably, that they eat large quantities of soft coal, which contains a large amount of sulphur. Perhaps this is the most economical method of supplying hogs with sulphur during the winter, when they require a good deal of carbon. But in the summer it is better to feed it to them in substances which contains less carbon, on account of their producing less heat. Mustard is one of the best things for this purpose, and on that account some of it should be sown in every pasture into which hogs are turned. If hogs are kept up, or are in small yards, it is well to supply them with the wild mustard that grows in the fields, or highways, or to cultivate some of the better varieties for them. They will eat its leaves, flowers, seeds and stalks.—*Prairie Farmer.*

Alderman Mechi writes to the London Times that he shall hereafter arrange to make his hay by furnace heat. The apparatus consists of a coke furnace, and a fan by which the heat is driven through a small chamber filled with grass. In fifteen minutes it is converted into hay, sweeter and greener than can be made by sun-drying; it works in all weathers, and dries grain, corn and roots as well.

A Successful Pear-Orchard.

Mr. Quinn has made pear culture a thorough study for more than ten years, watching with interest all the various modes of propagation, culture, pruning, the choice of varieties, and popular preferences in the market; and, like many other sensible men, has waited until he *knew something* before giving his experience to the public in book form.

Here is a row of Lawrence pears, as fresh and healthy as anything we have ever seen, with fine, regular shapes, and tall, pyramidal growth; looking down the long row, not a variation of the graceful outline could be discovered; all uniform, erect, beautiful, even to monotony, well fitted to be the pride of the orchard. The trees are planted ten feet apart, branch closely to the ground, just nine years of age, and just beginning to yield fruit. The Lawrence is a shy bearer, not yielding good crops until eleven years of age, but after that, by its productiveness, makes up for all deficiencies.

Summer pruning is one of the prime causes of his success. During the last two weeks of July, a thorough examination of the entire orchard is made with the pruning-knife. All shoots of new growth are trimmed back two-thirds, leaving only a short, stout stem. The wounds made with pruning are very soon healed over, while the strength of the tree, being confined to only one-third its original space, tends not only to mature the wood fully, but to develop fruit-spurs over the entire surface. This system has been practiced for years, and is the first point of success. The tendency of the tree to wood-growth is checked, and turned to producing fruit; while strong, sturdy lower branches are developed, capable of bearing up almost any weight of fruit. This system of summer-pruning not only makes a more symmetrical shape, and a sturdier, stouter tree, but doubles the yield of the fruit. In standard trees, left to grow at their will, observers notice that the fruit is borne away out toward the centre or tips of the limbs, and as the fruit begins to mature, the weight bends over the limb and almost breaks it. But on any of Mr. Quinn's trees, any limb will sustain the same weight without a curve and stand erect, as it were, with sturdy sinews, neither bending nor breaking.

Nearly all the trees of recent planting are trained as pyramids, branching close to the ground, and reaching from ten to twenty feet

in height. If allowed to grow as usual, with trunks trimmed for five or six feet, the branches would have occupied more lateral space, and yet have yielded no more proportionate fruit. The pyramidal form is practically the easiest, most economical, and most productive method.

The rows, as a rule, are placed twelve feet apart by ten feet in the rows. Nothing is grown between save three rows of rhubarb, which are gradually reduced to one row in the centre as the trees approach fruiting condition.

Mr. Quinn has found by experience that, if an orchard is cultivated in another crop, it seriously injures the trees to grow anything in the same rows, while nothing should come nearer than two or three feet of the trunk. The strawberry, one of the most suitable for this purpose of inter-cultivation, is still one of the most exhausting that could be chosen. A high state of fertility must be maintained if both are to be adequately supported. The ground is stirred but very little, and about the beginning of July a mulch of heavy salt hay or sedge grass, two inches thick, is applied entirely over the entire orchard. This remains during fruiting season, then removed, and the ground stirred a little.

Little or no benefit has been found to accrue from the practice of permitting grass to grow in the orchard. The latitude for the use of this method evidently does not reach north of Philadelphia, and is better adapted to soils and climates west and south of that latitude.

The Duchesse d'Angouleme is the only variety now grown on the quince roots, a very large number of trees being heavily laden with choice large size fruit.

After a fair experience with dwarf pears of different varieties, Mr. Quinn both asserts, and has facts to prove his assertions, that dwarf trees, as a rule, on quince roots, are a practical failure. All his trees are set low, so as to encourage rooting from the standard stock. And we could not fail to notice that where such trees did take root, they were double the size and vigor of the dwarfs beside them, and produced twice or three times as much fruit.

It is a noteworthy fact, however, that, for the first two or three years after the standard stock has taken root, the fruit is only of half size and inferior quality; this would seem

perfectly natural, as the tree is now making a new wood-growth, and all its vigor is directed toward the formation of a new tree. But it quickly recovers itself, and ever afterward redeems its reputation for fruit of largest size and fine quality.

We have conformed to Mr. Quinn's idea in our own method of planting dwarf trees, namely, putting the junction of the stocks four to six inches below the surface, and giving every favorable assistance to the formation of roots from the pear-stock. We are satisfied that trees thus grown will be twice as healthy, long-lived and productive.

Thinning fruit is a practice Mr. Quinn is particular to observe. Three times during the growing season the orchard is visited, and superfluous fruit is trimmed off, to allow the remainder to attain proper size and full flavor. If all the fruit that sets were allowed to mature, the result would be a vast mass of medium sized fruit, bringing less than half price in the market.

By thinning at least one-third off, the remainder attain a double size, and the highest prices are readily attainable. In some cases, the thinning has been fully one-half. For due regard must be paid to the health of the trees. All tendency to overbear, or straining the limbs, must be constantly restrained. It is hard to cut off dozens and hundreds of fruit, knowing that, if they were only ripe, they would be worth \$10 to \$20 per barrel; still it is a necessity unavoidable.

There are several other points worthy of notice. The mulch usually applied merely to assist the health and successful fruiting of the trees, is here also made to serve the double duty of protecting the falling fruit from injury. In nearly all orchards ripe fruit is constantly falling, and if it strikes the bare earth, is more or less injured. But the practice of mulching prevents any injury. The fruit falls upon a soft elastic cushion, causing no concussion of the surface to prevent immediate marketing. Another point is, that Mr. Quinn does not aim to bring his trees into early bearing. His first aim is to make the tree, make it right—stout, strong, healthy, handsome, able to resist wind or storm, and able to bear in due time the heaviest crops of fruit without any strain.

When this is done, the fruit does not fail to come when wanted. Hence, any one will be a little surprised to hear that ten years is set

as the limit for producing the first crop of fruit. A few single specimens of fruit may appear on each tree for several years previous; but no good crop is expected until the tenth year. Beginners in pear culture are apt to lose all enthusiasm if their trees do not begin to yield large crops in five or six years; and if at time of planting they believed no good crop would be received for ten years, it might act as a discouragement rather than an inducement.

The sagacious will find in this natural cause an argument for the favorable side of pear culture for profit, so many being deterred from engaging in this branch of fruit culture, because of the length of time before returns accrue, that only a few, and these skillful men, will have the courage and patience to follow it as a business. Still pear culture is increasing, and, as the prices in our markets show, will be for many years a most remunerative occupation.

The question of varieties will naturally interest the horticulturist more than any other. Of the sixty varieties under cultivation, the best for market have been thinned down to only ten, and even a few of these could be spared; still amateurs may find some more successful than others, and species of the whole list will be well chosen for planting.

The *Bartlett* is still the finest of the standards, almost without a rival as to price in the market, and the most popular of all known kinds. The price of this variety in the market has kept constantly advancing, and the popular demand to increase faster than the supply.

Grown as a pyramid, it forms by far the finest tree, of all shapes in which it is grown, and begins to bear early. When full grown, its yield is constant and abundant.

The *Duchesse d'Angouleme* is the only variety worth attempting to grow as a dwarf. It begins to yield early; but the produce, although increasing yearly to the tenth year, is not so abundant as when allowed to root from the pear-stock. Coming into market when all the early varieties of fruit have gone, it remains steadily profitable and liable to less fluctuation than any other variety.

The *Seckel*, the finest flavored and most delicious pear grown, is also one of the most productive and profitable. The fruit on full-grown trees is sometimes a perfect marvel, growing in clusters of three or four, so close together that the tree seems literally covered.

This variety is still the highest priced of any known in the market—outranking even the *Bartlett*. Its small size is more than made up in quality and quantity. The tree itself is a beautiful, erect, vigorous grower on the pyramid.

The *Beurre d'Anjou* is one of Mr. Quinn's favorite pears, of largest size, melting flesh, sprightly flavor, and a most abundant bearer. The tree is a handsome grower, and always vigorous and healthy.

The *Vicar of Winkfield*, though not advisable for eating, yet is hardly excelled for profit for cooking purposes. The branches are literally loaded with fruit, bearing fully double and treble as much as any other fruit we have yet seen. It should be in every collection, as it will rank for profit with either the *Bartlett* or *Duchesse d'Angouleme*.

The *Louise Bonne de Jersey* on its own roots seems to be a vigorous, healthy tree; but the fruit is not as plenty nor as large as when grown on the quince roots. It is one of the popular pears in the market, and always remunerative. Sometimes uncertain in yielding its crops. Perhaps this may not be the case on all soils.

The *Beurre Clairgeau* ripens at the same time as the *Duchesse*. Is a pear of the largest size, most beautifully tinted on the skin with crimson, yellow, and brown; fine rich flavor, and by far the handsomest and most attractive pear in the market. Does best as a standard on its own roots, and extremely productive. A finer sight can hardly be wished for than to see a perfect tree loaded down with the handsome fruit. If it has a fault, it is its tendency to pitch its leaves in August. If it will hold its leaves in all soils, it is one of the most profitable for general cultivation.

The *Doyenne Boussock* is later than the *Bartlett*, fine yellow color, slightly brown or red, but of first quality. Is considered one of the most valuable and reliable.

The *Japan Pear* is a new variety from Japan, shoots of which were grafted upon other trees. It resembles the apple in growth, and is the most vigorous variety of pear grown on the place—wood of this year's growth reaching, in August, six to eight feet. It is a fine pear for preserving; hardly desirable for eating. Produces fruit very early, a two-year old graft already bearing fruit.

The *Belle Lucrative*. Here is a delicious pear in every respect. Of first quality, equal

in vigor, productiveness, and other desirable characteristics to any thing we have named. And yet absolutely unknown in the markets, and commanding only half the prices of the rest. It is Mr. Quinn's first choice of the entire orchard. Medium size, beautiful shape; flesh very juicy, with fine texture, a melting rich taste, and highly perfumed flavor. Succeeds admirably with him, and must become as popular, sooner or later, as other first class varieties.

The *Beurre Diel* has few branches, but very strong fruit spurs; still does not bear early.

The *Andrews Pear* is one of the best new varieties, of delicious quality, and fine skin, very smooth, nice to handle; still, at present could be recommended only for amateur purposes.

Taking prices as they run in the market, the following list will represent the relative popular preference, from highest to lowest, although even the lowest is worth \$10 per barrel.

The best market varieties are: *Beurre Clairgeau*, *Beurre Bose*, *Bartlett*, *Seckel*, *Duchesse d'Angouleme*, *Virgalieu*, *Louise Bonne de Jersey*, *Beurre Diel*, *Flemish Beauty*, and *Vicar of Winkfield*.

Mr. Quinn would recommend only the following list for general culture, finding it best adapted to the purpose of beginners:

Early—*Bartlett*, *Doyenne Boussock*.

Medium—*Duchesse d'Angouleme*, *Beurre Clairgeau*, *Seckel*, *Beurre Bose*.

Late—*Beurre d'Anjou*, *Lawrence*, *Vicar of Winkfield*.

This list is found the best for Mr. Quinn's soil and latitude, and of course it would be difficult to prescribe lists for all parts of the country; but these two lists will probably comprise those most valuable in any place, suitable for either near or distant markets. In Mr. Quinn's new book, the subject of pears will be more fully treated, and we know it will be more warmly welcomed. As to the profits of pear culture, Mr. Quinn can tell us when he has gathered his fine crop. One year, from a row of about thirty trees, there was gathered about \$700. But we shall be under rather than over the mark, if we say that the present fruit crop from the entire orchard will yield between \$7000 and \$10,000.

—*Horticulturist*.

Draining.

Nothing is better settled than the necessity of draining such lands as are too retentive of water. However well constituted a soil may be, however abounding in the most valuable mineral ingredients, however rich in humus and salts, no cultivated crop will flourish well unless the surface soil, to the full extent of where the roots may extend, is dry during the growth of the crops.

It is probable that much the larger portion of our arable lands are so constituted as to be sufficiently drained by nature. They are so porous in surface and subsoil that the water passes freely downwards, and the air traverses as freely, as far as they may be broken. A soil that is thus permeable to water and air, and at the same time sufficiently retentive, that is, will not suffer the dissolved matters in rain water to pass through it, nor the gaseous matters in the air to escape from it, but will hold them both for the crops, is what we call a well-constituted soil. Coarse sands, while they are well drained, are deficient in the quality of retentiveness; they need clayey and carbonaceous matters to improve them. Every drop of rain that falls on the soil brings manure with it, and every particle of fresh air that follows the course of the water as it drains through. Thus nature is always helping us, as we help ourselves; if we put the soil physically in that condition in which it will properly receive and retain her manurings, it will never be entirely wanting in the elements of plant life.

But while a large portion of the earth's surface may be sufficiently drained, there is unquestionably a large portion that is not. This may embrace, and very often does, what are chemically the very best soils, such as contain all the ingredients requisite for an almost endless series of crops, but which mechanically are in such state as entirely unfit them for profitable use. Some have a clayey surface, through which water passes so slowly that it drowns in wet weather, and bakes in dry. Others have a porous surface, but impervious subsoil, through which the water cannot pass, and returns to the surface to be evaporated, and every drop that evaporates leaves a chill, and tends to make the soil cold and uncongenial to plant life. A soil but slightly moist on the surface, and with no stagnant water for three feet below the surface, may be heated at noonday to 120 degrees,

but it would be as impossible for the sun to heat a water-logged soil to that degree as it would be to heat an open kettle of water above 212 degrees by thrusting fuel under it. The difficulty in the two cases would be the same. The evaporation from the boiling kettle prevents the further increase of temperature; the heat is carried off in the escaping vapor. So over a water soaked soil, the heat of the sun, instead of insinuating itself among the particles of earth, is dissipated; it is consumed in evaporating the excess of water when it should be warming the earth. This gives us what we call a cold soil.

What is needed to make such soils what they should be, is a free circulation. If water stagnates within three feet of the free surface, we suffer the evils of an excess of that element; when we put grounds in such condition that it may pass gradually through, permitting fresh air to follow its course, we get rid of these evils. Air will follow water as it passes down, and both will leave in their course, to sufficiently retentive soil, elements of fertility which would otherwise flow away on the surface, or be carried away again into the atmosphere. If we find, that with a dry surface, the soil at a distance of three feet below is very wet, there is something wrong; draining is necessary to equalize the moisture, so that the surface shall not become entirely dry by a long suspension of rain, nor be excessively wet after heavy rains. This may be effected in ordinary soils by laying down drains three feet deep and thirty feet apart. When the bottom water shall be taken away, the surplus water above will fall, the soil will crumble, the moisture will equalize itself, air will circulate, and the soil will be proof alike against the evil effects of excessive rains and protracted droughts.

Some of the more striking effects of draining may be enumerated. All kinds of manure will act more promptly and more effectively on a drained soil. They will not be decomposed and prepared for the use of plants while soaked in an excess of water and excluded from the air.

Draining enriches the soil by causing it to absorb the rain water quickly with the carbonic acid, ammonia and other manurial elements, which otherwise would flow off on the surface or evaporate into the atmosphere.

It preserves the soil in great degree from

washing, by allowing the falling water to pass quickly into it.

The ground will be more easily worked; a much lighter draft being required to break a friable loam than a soil run together by the water and baked by wind and sun.

Seed time will come earlier, and frosts will hold off later in the fall. This is often a matter of the greatest importance. A crop escaping from the frost of a cold spell in September may be a long time exempted from injury. In the tobacco crop, we have seen, in the same neighborhood, an advantage of three weeks gained by a favorable locality. The same effect would be produced by difference of soil in respect to dryness; the coldness caused by evaporation from the wet soil causing frost when the dry soil would escape.

Land well drained will continue longer to give crops without manure than undrained, because the roots have a wider range for food, and when manured will give a larger return for the manure used.

Pastures will be better on drained lands, because the grass will grow more uniformly in wet and in dry weather, and will start earlier in spring and hold out longer in autumn; the roots will penetrate deeper, and the pasturage will not only be sweeter and of better quality, but will not deteriorate and give place to coarse and indifferent grasses.

What is known as "winter killing" in wheat, the result of freezing and thawing, is owing to excess of water, and can be remedied by getting rid of the surplus. On all lands subject to this heaving, by which the roots of wheat and clover are literally drawn out of the earth, we are at the mercy of the winter weather. We rejoice when our crops are covered with a protecting snow, or when the elements are so ordered that they are not subjected to the alternations which so disturb their repose. We do not seem to know that judicious drainage would make us independent of the fickle elements.

Another obvious effect of draining is the facility with which a well-drained soil may be pulverized. A wet soil can hardly be brought to that condition which we look for as the result of thorough tillage. While wet, any attempt at tillage causes it to bake, and produces just the opposite condition to that we desire. If allowed to stand till dry enough, a single day of wind and sun will sometimes bake it to that extreme of hardness which

will defy our attempts to subdue it. Every cultivator understands the necessity of thorough pulverization. Enthusiasts have gone so far as to sum up all we can do to fertilize a soil in that thorough tillage which consists in breaking and reducing its constituents to the utmost degree. It is manifest how impossible such cultivation must be, when excessive water is got rid of only by the joint action of sun and wind.

From the effect on the soil, and especially by diminishing evaporation, we might safely infer that the tendency of drainage would be to dry the atmosphere, to free it from miasma, and render it more conducive to health. We find this inference well sustained in districts which have been subjected to extensive drainage. In England, especially, it has been ascertained that the average of human life has been prolonged several years, under circumstances where it can be attributed to no other cause.

Emerson, in his "English Traits" says: "Chat-moss and the fens of Lincolnshire and Cambridgeshire are unhealthy and too barren to pay rent. By cylindrical tiles and gutta-percha tubes, five millions of acres of bad land have been drained and put on equality with the best for rape culture and grass. The climate, too, which was already believed to have become milder and drier by the enormous consumption of coal, is so far reached by this new action that fogs and storms are said to disappear. In due course, all England will be drained, and rise a second time out of the waters."—*Weekly Sun*.

Management of Breeding Sows.

The following directions are from the circular of a successful breeder, John Haight, Napierville, Ill.:

A sow should never have pigs before she is a year old. It is better if she is eighteen months old. If allowed to breed before she is a year old, she will have but few pigs, and but little milk for them. An old sow, like an old cow, will give more milk than a young one. Hence it is said that an old sow will have larger and better pigs than a young one, because they get a bounteous supply of that which is most natural to them, to wit, the milk of their dam. As soon as it is ascertained that a sow is in pig, which will be known between the 19th and 22d days after taking the boar, she should be fed lightly,

and allowed to have plenty of exercise. She should run to grass and the ground. A sow will run four months, less nine or ten days, from the time she takes the boar to her time of littering. Sows will vary a little. Old sows will run longer than young ones, and some breeds will run longer than others; but they will not in any instance vary a week. A sow should be put upon a floor in a dry and warm place to litter, with a very little cut straw or hay for a bed. A railing or board should be fixed against the sides of her pen around her nest, about eight inches above the floor, and it should be just out from the sides of the pen from eight to ten inches.—When a sow lies down, if a pig or two happens to be under her, they will generally slide out and get crushed between the sow and the sides of the pen. If this railing is fixed about the nest, the sow's back, in lying down, will strike it, and a pig or pigs in sliding from under her, instead of getting crushed between the sow and the sides of the pen, will escape injury by sliding under the railing.

A sow should be shut up three or four days before her time to have pigs, and fed on milk, and wheat or rye bran and middlings, made into a thin slop, to bring her to her milk. If a sow has plenty of milk when she litters, her pigs will not be likely to get killed, because they will get all they want and lie down in a pile and sleep, whereas if the sow is scant of milk, the pigs will be hungry and will be scattered around her, constantly working at her, and are therefore quite likely to get killed. She should be kept up until her pigs can run smartly, say ten days or two weeks, but not longer. If confined too long and fed on strong feed, to wit: dry corn or meal, she will become ravenous and eat her pigs. They are not so likely to become so on slop feed.—While closely confined they should be supplied with a plenty of fresh dirt daily. To counteract the effects of oleaginous food, something of an alkaline or vegetable nature must be given them. A sow should always run to grass and the ground a week or two before having pigs. Grass will affect the milk of a sow the same as it will that of a cow, increase the quantity and lessen its strength, which is very essential when the pigs are quite young. A sow should never be allowed to have pigs before April in the spring, nor after October in the fall, because cold weather is very injurious to young pigs.

• The Insect and Its Enemies.

BY A. FRIEDRICH VON TSCHEUDI.

Translated for "Our Dumb Animals," by M. B. A.

ON THE EXCESS OF INSECTS.

Of late this great police service of the bird-world seems to be insufficient. We hear from time to time, from every district of Germany and Switzerland, complaints of the increase of insects. Suddenly insect species appear in extraordinary excess that formerly existed in moderate numbers. They devastate the fields, the vegetable gardens, the corn, flax and fields of cabbage, the fruit trees, the woods, torment excessively our domestic animals, annoy us even, and threaten the very means of our existence. This is not to be wondered at, when we take the following circumstances into consideration. Of the twenty thousand kinds of insects of Germany and Switzerland, about one thousand kinds belong to the noxious class. Most of these lay yearly hundreds, many of them thousands of eggs, and their young develop so rapidly, that they, after a short time, lay eggs themselves, and thus one pair quickly increases to several thousand family branches. So the black beetle can increase to twenty-two thousand, and a plant-louse to several millions in one summer. But not only these little enemies grow quickly to a great host; larger ones also have a fearful power of increase. So, for example, a field-mouse, from May till October, has every five weeks eight to twelve little ones. At a month old these bring forth, so that a single pair increases in the first year to two hundred, in the second to ten thousand, or twenty thousand, and can then lay waste the vegetation of a large district.

Let us look at these inimical creatures nearer a moment. Among the chafers, the May-chafers make the worse havoc, which, under favorable conditions, devour the buds and leaves of the trees, as larvae, almost more devastating, eat up the roots of the field-plants, and appearing in frightful numbers, often lay waste an entire neighborhood. Strictly speaking, these chafers might be applied to various uses; they form a valuable manure, good feed for hens; dried, are eagerly eaten even by cows, and increase the quantity of their milk; our chemists understand how to make a fine brown color out of cock-chafers, a good Prussian blue, a great deal of oil, (out of sixteen qts. chafers, six qts. oil,) a clear burning gas,

good wagon grease; and our cooks, finally, out of the same chafers, prepare a nourishing and agreeable soup, (the crab-soup.) All this is certainly very fine; but if the cock-chafers were not by all means exterminated and limited, they would, after a few decades, so devastate entire tracts of the land, that neither hens nor cows, neither cooks nor chemists, could exist upon it.

In May the chafer leaves its chrysalis, seeks the young foliage of the trees, and takes a mate. The female lays its from twelve to thirty yellowish-white eggs in loose earth, out of which, in from four to six weeks, creep the little larvae. In these circumstances they remain, on an average, three and one-half years, and live upon the roots of young trees and other growth which is attached to them.—They change into a chrysalis in the fourth year, to creep out as beetles in the following spring. The swarming year—that is the year in which they are specially numerous—is generally every fourth year. Their destruction is best accomplished by shaking off the freshly hatched beetles from the trees between sunrise and nine o'clock in the forenoon, during which time the insects hang on the branches as if unable to move. If taken after they have laid their eggs, the result is small; one must go to work when the *first beetle* is observed. In many places they have become such a pest, that their destruction is carried on much more industriously. The collected beetles are generally drowned in boiling water. They make an excellent manure, dried beetles being worth half as much as guano.

The weevils are in their various species ruinous to our fruits, nuts, grains and forest trees. They lay their eggs in the germ of the blossom, and the maggot gnaws the fruit.—The black beetle lays an egg in every kernel of corn, as the maggot developed out of it will need at least thus much food. This changes into a chrysalis in the empty shell when the grain is consumed.

The different kinds of small beetles that infest the bark of trees are the most dangerous enemy to our woods. They keep themselves chiefly in the bark of the trunk, and bore a passage for themselves into the wood, from which the trees die. There are rich forests in which these wood-destroyers have in a few years killed millions of trunks.

Also in the highest degree injurious to the forests are spiders, wasps, moths, mice, fleas,

moles, ants, and other little enemies, which combine to cheat the farmer out of his industry.

How now to help ourselves from all these climbing, creeping, hopping, digging insects? Against single kinds precautionary measures can be taken, and a war of extermination carried on. We can kill mice with poison, traps, water, smoke, &c. We can keep our trees clean, scrape off the old bark and pick off the rolled-up leaves in winter, together with the eggs of the insects, &c.; but men, with all their activity, cannot do enough, and if insects appear in great masses, as sometimes happens, men are defenceless against them.

And such masses appear from time to time. According to the old chronicles, this was also formerly the case. Asiatic grasshoppers penetrated into Wales; yet these insects appear, from systematic observations of recent times, to be on the increase. On the Rhine, for example, the injuries to fruit trees and vines amount yearly to several hundred thousand dollars, without any means being found to prevent. The work of these insects borders on the miraculous; their ravages are well known in our Western States. Green caterpillars appear, now here, now there, in such countless numbers that they can be gathered by the barrelful. They pounce upon a field, devastate in a few days an incredible breadth, especially of flax, hemp and peas, and move on in immeasurable masses, no preventive as yet having been found effective in staying their progress. In Hessa, it was found, on careful observation, that where, from lack of trees, there were few singing birds, the greatest injuries were inflicted. Storms and their own excess destroy them in the end, or people find themselves under the necessity of burning entire forests.

If nature herself did not defend us from the inundation of insects—if she did not everywhere reach us a helping hand—we should without doubt be lost. Fortunately she has set against these destroyers their natural enemy. Insects have in insects themselves their most formidable foes. Among these, for instance, are a host of kinds which eat up and destroy other insects. In all, there are one thousand kinds of injurious and seven thousand kinds of useful insects.

But all this is by no means sufficient against the mass of insects. Other auxiliary forces must be brought into the field, and birds are

the most valuable. But alas! we notice a *decided diminution of insect-eating birds*, which keeps pace with the increase of those insects. We find a great decrease in the bird-world, which nature uses as the most important regulator in her great housekeeping. If we inquire further into the causes of the decrease of birds, we shall find them manifold, at home and abroad.

The Milk Mirror.

A correspondent speaks lightly of Mr. Guenon's milk mirror as a qualification or guide to the choice of a good cow. I have made the buying and selling of milch cows a specialty since I was sixteen years old. At that time I read the treatise of M. Guenon, and am free to state that the information gained from that book has been worth hundreds of dollars to me in my business. It will enable one to form an opinion as soon as the calf is born, whether that calf will be of value for milk purposes or not. If the calf has four good teats besides the two false ones—I have seen four false ones—with a streak of fine soft hair extending the length of the udder, said calf will certainly make an average milch cow, and stand a good chance of making an extra good one. In stock noted for milking qualities the male will show the same signs.

In purchasing beef cattle I have oftentimes bought promising heifers and cows at a discount for beef which were worth to me far more for milking purposes.

Dry cows and heifers always show the milk mirror and false teats, if they have them, while the shape of the bag, etc., must await development. I do not wish to intimate that all good cows must have the milk mirror by any means, but I do state that I made it a rule to select from my droves those that have milk mirrors for dairy purposes, and those for beef which have none. I have sold many a cow to private families on trial, warranted to give satisfaction, and have never had one returned that had a good milk mirror and was gentle.

In my cheese dairy, which varies from ten to thirty cows, those with well developed milk mirrors are the best; in fact, I have never seen a poor milker with a large, perfect, well developed milk mirror, corresponding with Francis M. Guenon's marks, unless said cow was sadly out of condition. My rules for choosing a good cow are:

1st. A good, strong constitution; showing thrift; a hearty feeder, with the ability to digest whatever food she may choose, or can get to eat.

2d. Fine limbs, with light head, horns and neck; straight back, light, slim tail, with heavy hind-quarters, making a ridge shaped animal, with a thick, soft, movable hide.

3d. The milk mirror, which should show not less than two false teats, with a wide streak of fine, soft hair, running from the bag upwards to the tail.

4th. A kind, gentle disposition, with plenty of life, bright eyes, playful and active—still not vicious. Let me say here that vicious cows are mostly made so by bad treatment.

5th. The bag should pitch forward, holding the same position to the body that a single shovel plough does to the beam.

I have never seen a fleshy bag of this description, and when the milk is clean drawn from it, it will be as empty, as soft and pliable as a well worn dish cloth just wrung out.—The smaller the bag is, after milking, the better. The milk veins should run as far forward as possible. The larger the orifice in the teats the better. This can be felt in heifers before they commence to give milk.—*Cor. Prairie Farmer.*

MOWING WITH A CAMEL.—Being in the Park in New York, the other day, we saw—what perhaps few of our readers have ever seen—a camel mowing! Here one of these humped animals was harnessed to a lawn mower, which he drew with great steadiness and apparent ease. The harness resembled a breast-plate for a horse, with the plate resting on his neck in front of the hump on his shoulders, with the shoulder strap under his body, behind his forelegs. He threw his weight into it as the ox does into the yoke. He was not a very large sized camel, but would weigh perhaps nine hundred pounds. He had mowed an acre or more, cutting the grass very smoothly. There was in the immediate vicinity a flock of beautiful Cotswold sheep under the care of an old Scotchman and two dogs; thus indicating to what use the lawn grass would be put in the coming winter. There were some two hundred of these fine sheep in the flock. There was also a herd of deer and elk in an enclosure in the Park, which, with the sheep and camels, have to be fed with hay in the winter.—*N. E. Far.*

An Experiment in Wheat Culture.

MAXEY, GA., July 15, 1860.

I take the liberty of giving you the result of an experiment in wheat culture just concluded in this vicinity. Mr. Samuel Baily, of this place, was the experimenter, and he has succeeded in raising nearly fifty-seven bushels of wheat from one acre of ground. This astounding yield was produced, as told to me, by the following means:

In the first place the land was thin and exhausted—had been in corn the previous year, and by the use of manure he succeeded in making seventeen bushels of that crop on the acre.

About the last week in last October he broke it up with a two-horse Brinley plough. Upon this he spread, broadcast, six two-horse wagon loads of well-rotted stable manure, which was turned under by a cross-ploughing with the same plough. Upon this he sowed, broadcast, two hundred and fifty pounds of dissolved bone, which was harrowed in with a two-horse revolving harrow. He then sowed one hundred and twenty pounds of wheat on the acre and covered it with a heavy brush, dragged over it by two mules. The clods were beat down with a maul in the absence of a roller. This was on the 2d of November. In the early part of February, the wheat being then about six inches high, he sowed, broadcast, a top dressing of two hundred and fifty pounds of ammoniated phosphate. Late in March, when the wheat was in the boot, he applied two hundred and fifty pounds of ammoniated dissolved bone and seventy-five pounds of salt ground together. This was applied early in the morning on the dew, one-half the mixture first and the other half at the end of a week.

The grain was cut off with a common reap hook as it ripened in places, commencing on the 4th of June. The production of the acre was three thousand four hundred and fifteen pounds of good wheat, of the variety known here as Johnson wheat. Mr. Baily does not know what the six loads of stable manure cost him, but the prices of the others are as follows:

250 lbs. Dissolved Bone.....	\$3 75
250 " Ammoniated Phosphate	7 50
150 " Dissolved Bone	10 00
75 " Common Salt	1 00
	\$27 25

The land was measured and the wheat threshed and weighed by disinterested persons.—*Nashville Union.*

The Chemistry of Agriculture.

At a meeting of the Devon Chamber of Agriculture, at Newton Abbott, Mr. J. W. Clarke, of the Castle College, Torquay, said: Chemical action, aided by increased demand for corn, is the motive power which has enabled agriculturists to develop the productions of the land to the wondrous extent we see in the 19th century. Compare the agricultural condition of the country and the chemistry somewhat less than 200 years ago with that of the present date. Macaulay tells us that we would not know one landscape in a hundred, or one building in 10,000, if we could see the England of 1685; thousands of square miles, then moors and fens, are now cultivated and thickly populated; manufacturing towns and seaports were then a few straggling huts; the population of England was then 5,200,000 souls. The greatest estates then little exceeded £30,000 per annum. The whole income of the government was about £1,400,000 per annum. The taxation, in a time not exceeding two lives, has multiplied forty fold, and the public resources have proportionally increased. In 1685 the produce of the soil then far exceeded in value all other fruits of human industry; the arable and pasture lands comprised about half of the kingdom, the remainder moor, forest, and fen. Many routes which then passed through barren tracts now pass through an endless succession of orchards, corn fields, etc. On the downs, bustards strayed in troops of 50 or 60, and were hunted by greyhounds. The number of Enclosure Acts passed since George I. exceeds 4,000, enclosing an area of little less than 10,000 square miles. In 1696 the quantity of corn annually grown in the kingdom was less than 10,000,000 quarters; the wheat less than 2,000,000. The turnips had only just been introduced. During the winter months the gentry were restricted to using salt flesh on account of the want of winter food for the cattle, which were killed when the cold began. In 1867-8 the produce in a deficient harvest was 40,800,000 qrs.—four fold that of 1697—and 8,000,000 quarters were imported, including wheat to the value of £25,000,000, and 765,748 head of cattle, sheep and pigs. This increased demand for food was called for by the increase of our manufactures, and development of mineral wealth. The tin mines of Cornwall, in 1685, yielded 1,000 tons—one-third of present produce. Cornwall and Devon copper mines, then ne-

glected, now yield 15,000 tons of copper, value £1,500,000. At the Restoration salt was imported from France; 700,000,000 lbs. are now sent annually to foreign countries. At the Revolution 10,000 tons of iron were cast, now over 1,000,000. In the last year of Charles II. 350,000 tons coal were brought to the Thames; now 7,000,000 and the whole annual produce is 70 millions. The increased demand for agricultural produce made land ten times more valuable. This increased demand for products of the soil has caused the connection between agriculture and chemistry to be investigated. Nine-tenths of paid capital are embarked in agriculture, and 1,000 million of men are dependent upon it for sustenance. In past ages chemists sought after elixirs of life, etc., instead of studying the objects of nature. The lecture then touched on a few leading phenomena of nature, first noticing the chemistry of light. The three distinct principles of the sun's rays, viz.: heat, light and chemical power, or actinism, perform the most important part in the operations of nature. All natural objects, such as flowers and the feathers of birds, owe their colors to light and heat, which bid the germ of life lying dormant in the seed to burst forth, the eggs of the insect awake and live, and melts the ice, etc. The most remarkable of the three principles is the actinic ray, which leaves its trace everywhere; every object in the landscape is effected by it, and undergoes a destructive change. These influences combined with water, carbonic acid gas, and oxygen of the air, disintegrate the granites and limestones of our hills, crumbling them to the dust. The whole mass of vegetable mould is a body of substances decomposing. The river which flows by Lustleigh Cleave was once an impetuous torrent one-third of its present length. Becky Fall, two or three miles nearer the sea than now, and the hills which we now see were then under the waves of the sea. In course of time the sea retired, leaving the deep valley behind covered with mineral soil, without any of the soft brown layer which now covers the soil, which is formed by layers of decayed plants which grew on the alluvium decomposed by water and oxygen. This is the history of the vegetable soil of all our valleys, and in some measure the origin of our coals. In 1843 the principles of drainage were first expounded, and in 1845 a machine triumphed over the hitherto great difficulty and cost of

making drain tiles. Since then £80,000,000 has been expended in drainage alone. The chemical revolution then followed, and opportunity gave to the farmer the use of concentrated portable manure. The use of bones liberally used on the wilds and heaths of Lincolnshire, was the philosopher's stone which turned uncultivated tracts into fields of cultivated grain. In 1835 nitrate of soda was introduced, and the first cargo of guano was consigned to a Mr. Myers of Liverpool. In 1841 the *Journal of the Royal Agricultural Society* mentioned guano as a *curiosity*. In 1840 Liebig suggested the addition of sulphuric acid and bone to increase its fertilizing properties, and soon the farmers learnt that in order to grow great root crops there was something to be added to their invaluable "muck." The Pampas of America and the Baltic ports of Russia and Germany were ransacked for bones, but still the supply was insufficient to meet the increased demand for artificials. The fossilized exuviae and bones of the extinct world were found by geologists to be invaluable as manure. The vender of artificial manures found that his fertilizing stimulants were robbed of one-half their value on wet or ill-cultivated lands; he therefore eagerly advocated drainage and the preparation of the soil by the use of the best ploughs, harrows and clod crushers. His customers would have left had he not convinced them that the fault was in themselves, and not in the manure. A man soon grudged growing weeds with the fertility he had paid hard cash for, nor could a manure costing £14 or £15 per ton be refused the economy of a machine to distribute it carefully. By these improvements ten times more stock is fed on the land than it maintained before. At every stage of progress an English modern farm produces an enormous quantity of food for man on a limited surface. Upon the agriculturists' skill, under Providence, depends whether plenty or scarcity prevails in the land.—*Mark Lane Express.*

Study of Botany.

Of the sciences that bear directly upon agriculture, botany is to be reckoned as among the first. The farmer is brought into closer contact with nature than any other man, except the professional student of nature. He dwells and works in the midst of the great laboratory.

Perhaps chemistry may offer him more direct and immediate aid in the furtherance of his labors, but a knowledge of botany is scarcely less important. Every plant he cultivates has a history. The mysterious laws of vegetable growth offer to the inquisitive mind a never ending field of investigation, study and thought.

If we had it in our power, we would cause the study of botany to be pursued in every school where anything beyond the rudiments of education was taught. Certainly in every high school, in every academy, and in every college, it should constitute a prominent and leading study.

A knowledge of botany, even if it does not go beyond the names and properties of the plants, the trees, the grasses and the flowers, which everywhere surround us in the country, adds an unspeakable charm to country life. Just as a traveler, who is familiar by long years of study with the antiquities, the history, the literature of ancient, medieval and modern Europe, views every scene in any way connected with the history of the past with infinitely greater zest, because he is capable of a fuller appreciation than another who has no such advantage—so a farmer, or any dweller in the country, who has a knowledge of botany, has within himself infinitely greater capacities for a full appreciation of nature, than one who has not this advantage.

But especially should the farmer study and make himself familiar with the common plants of the farm. This is not so formidable a task as many seem to suppose. The hardest part of it, for one who has everything to learn, is to begin. A good beginning once made, the interest increases, intensifies, becomes almost a passion, and the subsequent acquisitions bring with them their own reward.

Our popular education is greatly defective. It depends too much on books, and makes no aim to impart a knowledge of things. It trains the intellect, and leaves the practical world of nature alone. It will not always be so. Our education must become more practical, and aim to fit the young more perfectly for the duties of every-day life. And when this change comes, as come it must, the study of botany will be elevated to the highest dignity, and assume a position which deserves importance.—*Mass. Ploughman.*

A Profitable System of Farming.

It is the practice of some of our farmers—the shrewd ones—to raise grain and hay, and then purchase stock in the fall to feed it to in the winter, selling (the fat or improved) stock in the spring.

This is successful, in all cases where properly managed—indeed we know of no exceptions. Much hay, particularly clover, is thus raised—two cuttings of clover, one of timothy or timothy and clover—and the grains are harvested early, cut when partially green, and thus (the straw) cured and fed. Much of the fodder is cut (with straw cutter), and meal and roots added. Corn is best for fat, other grains for growth.

Thus, with such feed, and with good hay, early cut and cured, young stock, of all kinds, is kept growing—sheltered well, of course, and well taken care of—and milch cows continue their flow of milk till late, giving October quantities, and qualities also, especially on the hay.

In this way the grain, in good part, as well as the hay and fodder, are used on the farm, and the refuse (manure) goes to the land again, in each case holding the land good and improving it. This manure is used mostly to grow grass, put on top and finely worked down, giving a chance for the blades to clear themselves sooner, and for the soil to abstract the strength of the manure, as soil is known to possess this attractive and disinfectant principle. On corn ground, coarse manure is frequently drawn and ploughed under. This is well. But the same manure used to form sod, thicken it, would probably have done more good, benefiting the grass first, (by drawing largely from the atmosphere—clear gain,) and then affording increased manure in the sod, that is, more sod in consequence of using the manure. Hence some farmers—and they are among the best—use sod only as a means of manuring. It is a plan that needs not our recommendation, as it is seen everywhere what sod will do, and especially what it will do if enriched and thickened by manure.

The land, by this system, is thus kept rich, so that grain can be raised at any time, and at high average rates. This, of course, pays largely, excellent crops of wheat, corn, barley, oats, etc., being grown yearly. This alone would be a success. Then add the improvement in stock by feeding, which is almost

equal in net gain, and the advantage of this course will be plainly seen.

But the fodder must be cut green, when the grain of whatever kind is in the dough; and the grass cut when in blossom or sooner. An excellent plan in this case is, to sow oats and barley together. This is being tested here with satisfaction. The crop will be heavier, and most excellent to feed. But clover should be, and is, a *main* reliance. It enriches the land wonderfully, and affords at the same time the best and most abundant of feed, for either milk or flesh. But it must be cut and cured early.

This is making money on the farm, selling your stock and your grain, but not your fodder. You are thus keeping what is your own, and disposing of what the atmosphere gives you. This mainly. And it can be afforded, as the mineral product of the earth is inexhaustible, it needing but the aid of the atmosphere (in its influence and its additions) to develop it.

One chief advantage of this course is, you can get more off your land by mowing than by pasturage. The trampling and hurting of the roots and tender blades is avoided. It is hence an axiom in farming that meadow yields more than pasture. An acre of meadow will keep a cow, but it requires more pasturage to do it the same length of time. Hence those farmers (the best) who practice this mode usually soil their cattle and horses. They find it an advantage. For this purpose they have their favorite grains and grasses, clover, corn, Hungarian, rye, &c. And these cut green, as they are, are nutritious and healthful. Greater yields are thus obtained, and the manure also secured, which is but partially the case in pasture.

The season has been a favorable one for hay. Now is a good time to embark in this enterprise. There can hardly be any loss in any case, while the chances are decidedly in favor of success. Of course it is with this as with any business, it must be engaged in intelligently and with care. Stock must have attention after having been purchased to advantage. Keep off every hoof from your meadows. Let them grow up as dense as they will, the denser the better; and save your manure for the less favorable fields.—Apply during the winter as the manure is made; all the stable manure, the fore part of the season, may thus be applied, and some-

times the whole season through, no heavy snows interfering. Spread always, from the sleigh or wagon. This is saving manure, as has been recently demonstrated. You have thus no manure to lose its strength in the spring, and none to draw.

This method will give you a growth of grass that will surprise you the first year; each year will improve the crop till you have a sod that is worth—it is impossible to say how much. Here it will be seen is the chief, or at least a principal benefit. The rest of the manure may be applied in the fall, brushed down—an excellent way.

The work thus consists principally in harvesting the hay crop and attending to stock in the winter. The rest may be devoted advantageously to the breaking up of sod and the raising of grain—corn in particular—which will yield large returns, affording much fodder and grain to fatten; afterwards barley, or wheat, or oats, a heavy crop, and seeded down. The soil will be in good order for seeding and will grow heavy crops, to be increased yearly by manure.

As to the stock to be kept, this may embrace any or all kinds. There are cattle to fatten, and cows for the dairy. The latter need be kept on only good hay. They will grow on it if of a good quality. The cost of the hay will be an offset to the increased worth of the cows in the spring. Corn is, of course, the feed to fatten with. So barley and oats ground together in equal parts, though this is better for other stock in connection with poor hay. Sheep need little but good hay. If it is young clover, nothing is better. This alone will grow them, and with a little grain, and good treatment and attendance, regular feeding, etc., will fatten them. Numerous cases of this kind have been reported, and all, or nearly all, with more or less profit. Milch cows in this section are always in demand, and these it is profitable to buy. Keep well, and good prices may be expected. It is seldom that this fails. If it fails, it is usually in the neglect of the stock. But do not think to improve a poor cow on poor hay. And to feed much grain is equally unprofitable.—Such hay may be cut and steamed or scalded to advantage; but it is still less remunerative than simple good hay cut early and cured well. This will pay, as we know.—*Utica Herald.*

The "Government Garden" at Washington.

N. C. Meeker writes to the New York Tribune as follows concerning an institution in which our readers are interested:

Among the attractions of the Capital is the government garden, under the charge of Wm. Saunders; and his management of pear trees is worthy of note. It is simply to plant on good ground, give fair and clean culture, and let them grow. Pinching, pruning, and all those scientific and complicated directions derived from the French, and adopted by our orchardists, he considers worse than useless, for he attributes blight and other diseases to this treatment. Whether right or wrong, he has an argument in his favor which ought to weigh—the trees grow as "unconfined as Nora's tresses;" blight is unknown, and all varieties are loaded with fruit. It may be said that his plan suits such a latitude and soil as Washington; if so, let it be adopted there, and let pears be grown for the supply of the country. The fine varieties of grapes are also grown here without any disease, by placing two boards like a roof, along the top of the trellis.

I was surprised to see the China tea-plant growing vigorously in this garden. Mr. Saunders said it had stood without protection several years, and now it would seem that the growing of tea in this country is not to be considered with reference to the climate of Tennessee, or any other Southern State; but as to whether the people desire to grow it. I can see no difficulty in almost any family, at least South of Philadelphia, and, perhaps, even North of it, growing their own tea, and if they are real lovers of tea, they ought to take the little care and trouble required, for if they do, they can have an article only equalled by such as is obtained in China itself, free from adulteration, and unaffected by the long sea voyage.

It is customary for some agricultural writers to disparage this garden, but I think they are unwise, and that they ought to be glad that among the appropriations for so many objects, horticultural and like interests obtain a small share, and I am certain that the country ought to receive great benefit therefrom.

The currycomb should not be neglected; its use on all kinds of neat stock and horses is a great preventive of disease and vermin, and is productive of health.

Commercial Fertilizers.

The Secretary of the Connecticut Board of Agriculture procured last winter samples of sixteen articles known in commerce as "fertilizers," and submitted them to Prof. S. W. Johnson, of Yale College, the well known agricultural chemist, for analysis. They were received, and without names or labels, with the exception of numbers by which to identify them, were submitted to Prof. Johnson by Mr. Gold, Secretary of the Board. Upon receiving the results of this analysis, the Secretary added to each its name and price, and has published the whole, for the benefit of farmers.

The report shows also, how much it would cost to buy in other forms the materials which give these fertilizers their value. Thus the farmer has before him all the information needed to choose the cheapest material for his purposes, whether it be a patented or proprietary compound, or a mixture of his own manufacture.

The analysis proved that in every instance most of the substance consisted of water or sand or carbonate or sulphate of lime, or some other material of little value. These materials were mixed with phosphates and nitrogenous matters in very different proportions; but the really valuable component parts are but a small proportion of the whole. Prof. Johnson reported that there was good reason to suppose that some of the articles sold as fertilizers, and for which high prices were paid, were the products of deliberate fraud; their value to the farmer being in strange contrast with the price at which they are offered and advertised.

The sample which proved the best of all is sold for \$56 per ton, and contains actual fertilizing ingredients which it would cost the farmer \$47.32 in gold, or more than \$60 in currency, to buy separately in any common form. Next to this comes one, the useful parts of a ton of which are reckoned to be worth \$32.09 in gold, and which is sold at \$65 in currency. On the other hand, a popular article, sold at \$28 per ton, is estimated to be really worth as a fertilizer not more than \$2.33 per ton in gold, or but one-ninth of its price; and many other favorite articles of this class seem to deserve their reputation but little better, if the samples obtained by Mr. Gold and tested by Prof. Johnson were fair specimens.

It is not to be supposed that swindling in

fertilizers is confined to New England. Indeed, we question whether this business of swindling is carried on to a greater extent in any other State in the Union, than in the State of New York.

The above statements point more strongly than ever to the necessity which we have so long and so persistently urged, of some action on the part of our State authorities, for the protection of farmers in the purchase of fertilizers. We trust that the next Legislature will take action upon the subject, and make the penalties for this kind of rascality sufficient to check, if not prevent it.—*Utica Herald.*

How to Market Butter.

The Boston *Cultivator* tells how the best farmers near Philadelphia get so high a price for their butter:

"First, they always make a first-class article, so their customers, sure of getting the best there is, will not desert them on account of a rise in the price. Second, they bring in their butter in a showy and attractive condition. No pot or delf ware, no tub or pail of oak or hemlock, no vulgar firkin is used to entomb those noble balls, golden-hued with the aroma of white clover and *Poa pratensis* lingering in the firm grain. A large tin vessel, designed expressly for the business, has chambers at each end, into which ice is put. The wooden shelves, about three inches apart, rest on little projections from the sides. A layer of balls is then placed on the bottom and covered with its shell, but not so as to touch or mar the handsome print of a sheaf of grain, which stands out on the top of each ball; on the shelf another layer of prints, and so on till the vessel is full, they containing forty or fifty pound prints. The tin, with ice in each end, is then set in a wooden tub which has been cooled with ice or spring water.—Over this is drawn a cover of padded carpeting, with oilcloth on the top. Thus hot air and dust are wholly excluded, and the butter rides to the city and opens in the market-house in as fine condition as when packed in the spring-house. In just this way, with this degree of care and skill, is the best Philadelphia butter made, marked and marketed. No wonder the Philadelphians would rather pay seventy-five cents than go back from such manna to the leeks and onions of the common firkin.

The American Farmer.

Baltimore, November 1, 1869.

TERMS OF THE AMERICAN FARMER.

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WORTHINGTON & LEWIS.

New Office, 4 South Street,

Near Baltimore Street,

BALTIMORE.

State Agricultural and Mechanical Association.

The first great Exhibition of this Association is in progress while we write these lines, and we are only able to give a sketch of its doings for our present issue. A more full and complete account than it is possible to furnish now will be made up for our December number.

MEETING OF OLD FRIENDS.

The pleasantest part of the great gathering at this Exhibition is the meeting of old friends and the warm and hearty greetings of those whose faces we have hardly looked upon since the old times, when, year after year, were gathered here the best of our people to the annual State harvest-home. There are wrinkles on the faces of those who were fresh and ruddy then, dark beards have become gray, and gray beards white, the traces and tracks of time and sorrow; and many familiar faces are missed, and many young ones grown out of childhood and the recollection of their elders; yet the good Maryland hearts are all about, and forgetting, to the utmost of each one's power, all the wretched past, they are together again in the good works of peace.

THE OPENING.

The opening day of the Fair on Tuesday, 26th, was bright and auspicious, and showed to good advantage the beautiful grounds of the Society at Pimlico. These comprise an area of nearly 80 acres, and are situated two

miles from the Northwestern boundary of the city, on a plateau at an altitude of more than four hundred feet above tide-water. The grounds are well enclosed, and the surroundings are strikingly picturesque. Nothing could be handsomer than the wide-spread view of the beautiful country around, dotted here and there with elegant villa-residences or substantial farm houses, and adorned with glowing colours of autumn. The view of this from the pavilion is well worth a ride to the grounds.

The pavilion is an imposing structure two hundred and eighty feet in length, forty feet wide, and fifty from basement to apex of roof, and is built in the most substantial manner. The upper floor is devoted to the use of spectators, and commands a full and unobstructed view of the driving track, and whatever else is of interest to the general view.

It is estimated that on the day of opening there were upwards of ten thousand persons present, embracing representatives from the mercantile, mechanical, industrial, and, in fact, every interest of the city.

The accommodations for stock are ample, and the display of Farm Implements and Machinery, fine cattle, horses, hogs, and stock of every description was of the very best quality.

The committees are all busy making their examination, and will, no doubt, award premiums with strict regard to merit.

A large number of visitors from abroad are visiting the Exhibition, among whom are many valued friends in the good cause of agricultural improvement.

IMPORTED FOWLS.—Messrs. A. B. Neill & Co., of New Lisbon, Ohio, continue to supply orders for Imported Fowls. A pair of Light Brahmas which were shipped by them, and which we have seen, are undoubtedly *pure bred*, and give the purchaser entire satisfaction. "Fanciers" would do well to give Messrs. Neill & Co. a trial.

THE AMERICAN POMOLOGICAL SOCIETY.—We are indebted to the venerable President, Col. Wilder, for a copy of his address before this Society at its recent grand exhibition at Philadelphia. We are glad to learn that the exhibition was a great success, and that nearly every part of the country was represented.

Agricultural College.

Professorship of Chemistry and Physics in their application to Agriculture.—Professor Jas. Higgins, so well known as State Agricultural Chemist, and for some years past Professor in the Agricultural College, was constrained on account of protracted ill-health to tender his resignation at a late meeting of the Board of Trustees.

Professor Antisel, of Washington, the able and accomplished Chemist to the Department of Agriculture, has accepted an appointment to fill the chair thus made vacant, and has entered on his duties.

We are glad to be able to say that the College has enrolled a larger number of students than at any previous period of its history, and is, in all respects, in a healthy and improving condition.

THE VIRGINIA STATE AGRICULTURAL SOCIETY, let it be borne in mind, holds its great Exhibition immediately after our own, and we hope will be very largely attended by our exhibitors and people. We are indebted to E. G. Leigh, Esq., Secretary, for a complimentary ticket, and greatly regret that our engagements elsewhere will not allow us to be there.

The Frederick County Agricultural Society had a fine Exhibition in October, attended by large numbers of interested spectators. President Grant and other prominent citizens were present, and an able address was delivered by J. Stanton Gould, of New York.

The Washington County Society held also a successful Exhibition.

CALVERT COUNTY AGRICULTURAL SOCIETY.—An Agricultural Society has been organized in Calvert Co., Md., and Dr. Geo. W. Dorsey chosen President. Vice-Presidents, Hon. John Parran, Hon. James Bond and Dr. J. F. Ireland; Recording Secretary, C. R. Belt; Corresponding Sec'y, Rev. S. Cornelius.

CONNECTICUT STATE POULTRY SOCIETY.—We acknowledge receipt of programme of the first Exhibition of this Society and a complimentary ticket. It will take place at New Haven, beginning 9th November, and continuing three days.

Literary Notices.

The Southern Review.—The contents of the October issue of this Review are: *Injustice of American Tariffs. The Theory of Reasoning. Sir John Coleridge's Life of Keble. Improvements Needed in Geometry. Lucian. The United States as a Military Nation. Virginia; Her Geographical Position. Battle of Ball's Bluff. Notices of Books.*

It were superfluous to say that these varied topics receive at the hands of Dr. Bledsoe and his assistants the ablest treatment, and that the Review maintains the rank it has held from the first issue, among the very first publications of its class in the language. A. T. Bledsoe, Baltimore. \$5 in advance.

The Educational Journal of Virginia.—Col. S. B. French, of Richmond, has called our attention to the prospectus of this journal, which is about to be issued by a committee of gentlemen appointed by the Educational Association of Virginia. There is certainly ability, and, let us hope, interest, enough in the subject of education in Virginia, to make this the leading educational journal of the country. We heartily wish it may become so, for it is of the utmost importance that the sound views held by the leading educators of the State should be maintained and diffused.

Once a Month.—This is "*A Baltimore Magazine of Choice Miscellaneous Selections*," fulfilling well in the character of the matter it furnishes what it professes. The selections of the October number are very choice. It seems designed to be mainly an advertising enterprise, and its literary matter is thoroughly interlarded with business notices, a feature which it takes time to get used to.

The Rural Carolinian.—We are in receipt of the first number of a magazine of 64 pages having this title, published by Walker, Evans & Cogswell, Charleston, S. C. \$2 a year, in advance. D. H. Jaques, editor.

Judging by this number, we may safely set down the *Rural Carolinian* as a very able co-worker of the several excellent agricultural journals already published in the Southern States.

On the first page we have the counterfeit presentment of that sturdy old Georgian, David Dickson, "the best and most success-

ful planter in Georgia, if not in the whole South," and a sketch of his plantation, management, &c. The *Carolinian* is well printed and well illustrated, and deserves ample success.

The Home Monthly.—Devoted to Literature and Religion. A. B. Stark, editor. Printed at the Southern Methodist Publishing House, Nashville, Tennessee.

The Ladies Own Magazine.—Edited by Mrs. M. Cora Bland, Indianapolis.

Descriptive Catalogue of Fruit Trees, Grapevines, Strawberry Plants, &c., &c., cultivated and for sale at the Georgia Nursery by Wm. K. Nelson, Augusta, Ga. We advise our friends in that quarter to send for Mr. Nelson's Catalogue and see what he has to say of his stock.

We have received the *Programme, Premium List, Rules and Regulations of the First Annual Fair* to be held at Cumberland, Md. We look in vain on the programme for the title of the Association, but learn that J. P. Roman, Esq., is President, and George Washington, Vice-President. The Fair will open on Nov. 9th, and continue four days. We hope our Alleghany county friends will be effectually and liberally aided by exhibitors and visitors from Baltimore and other parts of Maryland.

Smithsonian Report for 1868.—Hon. Mr. Garfield, M. C. from Ohio, has our thanks for a copy of his Report, and other like favors.

Messrs. Henry Taylor & Co., Sun Building, have favored us with copies of two handsome little volumes in paper, published by Dick & Fitzgerald, New York: *The American Housewife and Kitchen Directory*, and *The Young Debater and Chairman's Assistant*. We have got them only in time for this short notice.

Demorest's elegant illustrated Monthly of Fashions of Fall and Winter is received. The ladies all want it, for economy as well as for fashion sake.

It is stated that the Percheron horses, introduced into Central Ohio within the last few years, are giving good satisfaction, and are being bred more extensively this year than at any previous one.

Our Agricultural Interests.

Report of the Commissioner of Agriculture—Industrial Colleges—Southern Agriculture—Cattle Disease—Grape Culture—The Crops of the Year, &c.

The seventh annual report of the commissioner of agriculture and the accompanying report of the statistician of the department have been completed. They are valuable and interesting papers, containing important suggestions and recommendations and useful statistics of production, exports, markets, &c.

General Capron, the commissioner, in his report, speaks approvingly of the industrial colleges now springing into being throughout the Northern and Western States, which, he says, though various in character and aims, and, at present, in the weakness and inefficiency of their infancy, are destined to be powerful coadjutors in the legitimate work of this department. Already has the discussion attendant upon their organization elicited inquiry, corrected prejudices, diffused information and enthusiasm for a practical education, which cannot fail to accomplish good results.

It is gratifying to observe, says the commissioner, the evidences of vitality in Southern agriculture, which is progressively and successfully marshaling the forces of recuperation, and gradually dispelling the despondency resulting from the losses of civil war, the change in the labor system, the disruption of families and the impoverishment of estates. An impetus has been given to business by the introduction of Northern capital; and in the future more rapid progress may be expected from the same cause. Money, population, and skill in special industries are the requisites for success in developing the resources and extending and perfecting the agriculture of the South. In view of all the circumstances affecting cotton culture it may be deemed a remarkable fact that the yield has attained an equality with that of 1850, and is half as great as the excessive product of 1850 and 1860, which glutted the markets of the world, and would have caused a discouraging depression in prices but for the cessation of cotton productions in the years that followed. The cash receipts for the crop of 1867, were larger than those of 1850, though of less actual value as reckoned in a depreciated currency. The sugar interest is rapidly attaining prominence, the product having doubled in the last two

years. The total product of rice is also increasing.

The report says that the farmers of the country, while enduring the necessary burden of internal revenue taxation, and submitting cheerfully to imposts upon all foreign products consumed by them, will enter a vigorous protest against any proposition for the renewal of the abrogated reciprocity treaty, or any arrangement admitting untaxed and low-priced Canadian productions customs free, or at a lower rate of duty than is provided in existing laws regulating the tariff upon similar imports from other nationalities.

After referring to the great benefit to the agricultural interests of the country of the system of internal exchanges, the commissioner refers at length to the prevalence of fatal maladies among all varieties of farm animals, resulting in the annual loss of not less than \$50,000,000, which demands, he says, the prompt attention of this department, the vigilance of the agricultural associations, and national and State legislation. The report of Prof. John Gamgee on the Texas cattle disease will, he says, be presented to Congress at an early day.

The production of grapes for table use and for wine making has become an interest of great importance. General Capron says that vast sums of money, and much valuable time and labor have been expended in the endeavor to make the foreign grape a success, but without exception it has proved a failure in open air culture. These failures, however, have had a salutary effect in directing attention to the improvement of our indigenous species, and the progress of amelioration is both marked and rapid. The fact will be learned, sooner or later, that east of the range of the Rocky mountains, no climate has yet been found suitable for the continued healthy growth of the foreign grape. On the Pacific coast the plant seems to find a perfectly congenial climate.

The crop statistics of the present year indicate a more than average condition of agricultural prosperity. The wheat crop is somewhat larger than last year, the increase being about equal to that of the population, and may be estimated at not less than two hundred and twenty million bushels. The corn crop is much larger than last year, but may not be placed, on completion of the tabulation, at more than nine hundred million bushels.

The cotton crop, although of slightly reduced acreage, would have been excessive but for the damage from army and boll worms, yet the result will exceed two million three hundred thousand bales.

The report refers at length to the work of the statistical, chemical and entomological divisions of the department, requests agricultural and horticultural societies of the different States to contribute samples of grain, fruits, &c., for the museum; refers to the utility of the experimental garden and the improvement of the grounds of the department, and expresses the opinion that one of the most certain means of encouraging a taste for rural pursuits, both in agriculture and horticulture, and of instilling a desire for the study of botany and vegetable physiology, is that of proper embellishment of school house and college grounds. The commissioner says that the economy of a judicious distribution of seeds by the national government is scarcely known or appreciated. He gives illustration of this and recommends a more liberal appropriation by Congress for this branch of the service. The expenditures under each appropriation have come within the sums appropriated. There has been expended since December 4, 1867—the date of General Capron's entry upon the duties of commissioner—\$217,400, leaving a balance unexpended of \$103,600 for the remainder of the fiscal year ending June 30, 1869. The report of Mr. Cluss, the architect employed to superintend the erection of the building and the necessary fitting and furnishing, shows the completion of the whole in a substantial and workmanlike manner, embracing the laboratory, with its new and complete chemical apparatus, and the museum, with its convenient and tasteful arrangement of cases, and the library, at a total cost of about \$140,000. The balance under each head are deemed sufficient to meet all future demands of the present fiscal year.

The report of the statistician says: In 1839 the wheat crop was 84,823,273 bushels, or 4.76 to each inhabitant; in 1849, 100,485,994, or 4.33 to each individual; in 1859, 173,104,924 bushels, or 5.50 per capita; in 1868, by estimates of this department, 230,000,000 bushels, including Oregon and the Territories, which are not found in the tables. As the increase of population was thirty-five per cent. from 1840 to 1850, and also from 1850 to 1860, a similar pro rata increase from 1860 to 1868

would make our population 39,000,000. If the same ratio of increase could be expected through this decade, viz., thirty-five per cent. in population, and twenty-five per cent. in the wheat yield in proportion to population, the crop of 1869 would be 292,000,000 bushels; and that of 1867 should have been more than 250,000,000 bushels. Though far better than the two preceding crops—a fair yield upon a broad area—it probably did not exceed 224,036,600 bushels, exclusive of that produced by Oregon and the Territories. It would be a short wheat crop in 1868 that should not aggregate 270,000,000 bushels.

The drought and other causes have reduced the aggregate yield of corn this year at least one hundred million bushels. The final estimate is, in round numbers, nine hundred millions of bushels.

A reduction in the acreage of cotton is noted in every State except Texas, in which the increase appears to be about thirty per cent. The decrease, as compared with the previous year, is estimated at twenty-four per cent. in Louisiana, eighteen in Mississippi, thirteen in Arkansas, twenty in Tennessee, twelve in Georgia, eighteen in South Carolina and thirty-two in North Carolina. The returns of diminished acreage in early summer, did not excite apprehensions of a decrease in the crop of the year. The aggregate crop of the year was estimated in October at 2,380,000 bales.—*Daily Sun*.

ENGLISH WHEAT CROP.—Mr. J. B. Lawes has written his annual letter to the *Times* as regards the probable yield of English wheat the current year; and the remarkable success of his previous estimates entitles it to the general attention it receives from the English press. He reaches the conclusion: "That the wheat crop of 1869 is slightly below the average in quantity, and it will be also deficient in quality, as estimated by the weight per bushel. Assuming that an average crop is represented by a produce of 28½ bushels, weighing 61 lbs. per bushel, I am disposed to fix the present crop as equal to 27 bushels of the same weight." The quantity of imported wheat to be required by the United Kingdom from other countries, for the year to come, he estimates at 9,750,000 quarters, a quantity *two million quarters larger* than for the imports the twelve months preceding Aug. 31, 1869.

Effective Steam Tillage.

A correspondent of the English *Agricultural Gazette* says that no general rule can be laid down as to how land should be cultivated by steam-power, as compared with horse-power, owing to the diversity of soil, season and other practical data involved. It is possible that in some instances, steam-power may admit of more frequent ploughing and cultivating than horse-power, but in others the reverse may be the rule, one operation of steam being more effective than one of horses. No doubt under steam culture, as under horse culture, routine will be the rule, to a very large extent, such as one ploughing in autumn and so many times of the cultivator and harrows across the land in spring time. But routine is now nearly out of date, and forms no part of modern improved agriculture, either under horse-power or steam-power.

As a general rule it may be admitted that, once over the ground by steam, whatever the nature of the soil may be, is more effective than once over the ground with horses, whether in ploughing, grubbing or harrowing; but such a rule does not imply that steam culture involves fewer ploughings, etc., for in practice the requirements of the soil, season, etc., may demand the opposite rule, viz: more frequent ploughing with steam than with horses. We can readily perceive cases where frequent and effective tillage are both in favor of steam, and very probably this may be the rule for the vast majority of farms; but from such a rule there are many exceptions when once over the ground with steam is more effective than twice with horses; while in not a few examples steam can enter the field successfully, finishing its work at one operation, where horses have to wait a more advanced season for favorable weather, at a sacrifice, which the harvest following never fails to estimate at its true value.

DIARRHŒA IN FOWLS.—The causes are a scanty supply of grain, which necessitates an excess of green food; or an unwholesome dietary of any description, are the usual causes of this complaint. The treatment is simple: five grains of powdered chalk, the same quantity of rhubarb, and the same of cayenne pepper, may be administered; and if relaxation is not speedily checked, a grain of opium and one of powdered ipecacuanha may be given every five or six hours.—*Togetomier*.

Large and Small Farms.

So much that is crude and one-sided has been laid before the public on this subject that careful, discriminating thought is much needed. Scores of agricultural writers have poured out columns of cheap suggestions on the text:

"A little wife well willed,
A little farm well-tilled."

On the other hand, the best grain farmer in this State inherited 800 acres of good arable land, as well adapted to wheat and barley as any on the continent. Twenty or thirty years ago he sold all but 300 acres. This, he admits, was the grand mistake of his life. "At the time I sold it such a step was not a blunder," he adds; "and how could I have known that McCormick would give us such a reaper that my horses would do my threshing, my raking, my pitching, my mowing away; that the cultivator would set every hoe on the place to rusting; that a girl would put on her gloves and sun-bonnet, and as a morning's frolic do the work of six stout mowers?" English farmers and landholders were startled the other day by some very sensible but noways inspired remarks of Lord Stanley, who, after an agricultural dinner, said in substance just what our New York farmer has said: That one-hundred-acre and two-hundred-acre farms cannot be conducted on the most economical principles, because the small farmer was unable to purchase the tools which the large farmer could not afford to be without.

But there are limitations upon this line of development, set by the very nature of certain farm operations. Lord Stanley was talking of grain farms and husbandry tillage, not of the dairy districts, nor of root culture, nor of market gardening, nor of fruit growing, nor of floral culture. A British writer of less aristocratic lineage than Lord Stanley, but more accurate and painstaking, has collated the agricultural statistics of the United Kingdom, and he finds that on the chalk formations of England—that is, on soils where lime is an important constituent—there is a tendency to large farms and irregular incomes, because the grain-grower is so much at the mercy of climate. In the grass counties, where potash is the leading constituent of soils the tracts are smaller, the fluctuations less, economy stricter, and *profits on the whole greater*. There are two reasons for this which are as applicable to farming in this country as in England.

First, as suggested above, in grain farming there are more risks and greater losses from bad weather. Second, a grain farm to be profitable should be large, but the business ability that can wield a large grain farm—do the right thing at the right time, employ as many men and use as many implements as true thrift requires, and no more; that studies the markets, and forms a sound judgment as to the probable price of the different grains; that knows when to sell and when to hold back, when to put in more barley and less wheat, or more wheat and less barley—first-class business sagacity like this is uncommon. Such ability in railroad matters would make a Vanderbilt; in dry goods, a Stewart; in banking, a Peabody. The grain farmer who displays it is just as sure to buy out his neighbors, and join field to field, as Stewart on Broadway is to rear his vast palaces of trade on the ruins of a score of tradesmen less thrifty and sagacious. Thus we see that on soils suited to small grain there is a tendency to agglomeration founded in human nature and on economical laws,—a tendency that would condense titles into a few hands in many parts of England, if the laws of entail had not done so already; a tendency that will do it in certain regions of this country, no matter how democratically we sell our land by quarter sections. In regions where butter, cheese, roots, fruits, and the flesh of small animals give the husbandman his support, the tendency to big farms is not perceived, either in England or in the United States. In beef producing and sheep herd farming the tendency is to large areas under the control of one proprietor.

A survey of our national area with these distinctions in the mind may give us clear views of what the future is likely to develop in this respect. The Atlantic slope, with a few exceptional strips of limestone, is not well adapted to grain farming nor to the herdsman and shepherd. There is no true and lasting economy in carving it into tracts of more than 200 acres, and hundreds of farms of from twenty to fifty acres pay better in proportion to the area than any tracts in the country. This applies to the hill country—that is, the dairy counties of Western New York—but not to the Marcellus or green shales, extending from Syracuse westward to the lake, nor to the limestone valleys of Pennsylvania and Virginia. Many parts of

the great West, as for instance the Western Reserve of Ohio, are so well suited to a mixed husbandry that farms of from one to two hundred acres are profitable and will long retain their individuality. But regions specially adapted to wheat, as Minnesota, or to beef, as the great prairie, are fast presenting illustrations of Lord Stanley's theory. We hear of a herdsman in Illinois fattening 6,000 bullocks and a wheat-grower in Minnesota requiring fifteen reaping machines and wanting 125 harvest hands for two weeks in August.—*N. Y. Tribune.*

Modes of Tying up Cattle.

We have made pretty thorough experiments in all the usual modes of tying up cattle, beginning with the simple bow, made of wood; then the chains in common use; and, tired of these, tried stanchions. After using the latter a year or two, we substituted in their place a strong leather strap two inches wide. These soon became oily and soft from use, and it seemed that the cattle were more comfortable with them than any other mode of tying. They would lie down on either side, and had room to move about so as to change their position considerable. But as the stalls were arranged, this liberty caused occasional serious injury, as in moving about one cow would sometimes step upon the udder or some other part of one which was lying down. This might be remedied if more space were allowed between the cows. We had not this space to spare, however, and went back to stanchions, which are still in use.

There are some advantages in the use of stanchions over any other mode of tying. The work is more quickly and surely done. The cattle are kept cleaner. Having less freedom, they cannot hook nor rob each other, and are more under control while milking.

One inconvenience in the stanchion is, that cattle, when lying down, cannot get up easily in them. On rising they throw themselves forward and strike the shoulders, so that, occasionally, two or three efforts are made before the animal is on its feet. This may be partially obviated, however, by carrying the upper portion of the stanchions forward so that they will stand at an angle, instead of perpendicularly. This will essentially relieve them in the act of getting up. Another change which gives them more liberty, is in having the

space wider for the neck, at the bottom of the stanchions than it is at the top. This affords the animal more room to move the head about when lying down, and it cannot get it out when in that position.

A great objection to stanchions may be avoided by a proper arrangement of the floor when the barn is built. Cattle should feed from a floor a little higher than that on which they stand; at any rate, it should not be any lower, as it quite often is. This is done by raising the lean-to floor, in order to get a trench to receive their droppings. When this is done, the sleepers of the barn floor should rest upon the top of the timbers, instead of being dropped into mortices. Then the barn floor will be nearly on a level with that upon which the cattle stand. With some care in the arrangements, stanchions will be found the best, we think, all things considered. We have seen the "*Swing Stanchions*" in use, and noticed the movements of cattle in them. They certainly have a pretty large liberty when so tied, can step back and forward two or three feet, and have plenty of opportunity to tread upon each other, and *can lie down only on one side!* They did not strongly commend themselves to our judgement.—*N. E. Farmer.*

A Huge Farm and How it is Worked.

The *Cincinnati Gazette* has the following: "What do you say to a corn-field in Benton Co., Indiana, of 7,000 acres, in good condition and growing splendidly? It is to be found on the farm of Adams Earl, Esq., who resides in Lafayette. Messrs. Earl & Fowler have 30,000 acres in Benton county, in one body, well watered; and with permanent improvements, having 140 miles of hedge fence and 65 miles of board fence, 30 dwelling houses for tenants, three blacksmith shops, etc. To cultivate the corn land 100 one and two horse ploughs were kept in daily use, and on the pasture lands 4,100 head of cattle are now feeding for the New York market, and will be shipped this fall by rail. Messrs. Earl & Fowler give their personal supervision to the farm, besides attending to their separate interests, the former a jobbing merchant, and the latter, a banker. With the late improvements of farm machinery and harvesting implements, they are enabled to keep the model farm in good condition, and from present appearances the balance sheet will be on the right side, as heretofore."

From Germantown Telegraph.

When Should Lime be Applied ?

Different farmers would give very different answers to the above question. Some apply it just before they break up for corn, and plough it under for the corn crop; some spread it on the corn ground after it is ploughed, and harrow it in before the corn is planted, and others apply it to the grass after the wheat crop is taken off.

There are three established facts which must influence us in deciding the proper time for the application of lime: 1st, that it takes a certain length of time to produce its effect upon the soil; 2d, it drives the ammonia from barnyard manure whenever it comes in contact with it; 3d, its action hastens the decomposition of vegetable matter which the soil may contain.

To decide the first case, the farmer must satisfy himself as to what particular crop he wishes to benefit by the application of lime. If he wishes the corn to have the benefit, he should apply it at least one year before the corn is planted. If the grass is to receive the benefit, then he must apply it before the grass comes to its perfection; but in applying it with this view, reference must be had to the second item, with regard to its effect on the ammonia, by far the most valuable portion of the barnyard manure. The third proposition should also have its bearing upon the farmer's decision.

Let us examine into the effect produced by a coat of lime applied to the sod a year or six months before it is broken up for corn. This plan has its advantages, which may thus be enumerated: being applied for this length of time previous to ploughing, it is, when the sod is turned, just ready to assist in its decomposition, and causing it to be fitted for feeding the ensuing corn crop. It may be done either the spring or fall before the field is ploughed, thus coming at a leisure time.

This plan also has its advantages. The lime being applied to the sod, is turned under to the bottom of the furrow; most farmers plough deeper for corn than for oats, and consequently the lime is seldom brought to the surface, when ploughing for oats; and during the time the oat crop is coming to perfection, the lime, on account of its specific gravity, is sinking into the soil deeper and deeper. Thus when ploughing twice for wheat is practiced (as it ought always to be), the ploughing is

done deeply, the lime is brought to the surface, the manure is applied, and they come in contact, producing a great loss, as set forth in proposition third.

Lime, to produce its proper effect, must be retained where the air has access to it, or near the surface of the soil; its specific gravity being much greater than that of common soil, it gradually sinks through the latter, and very often out of reach of the plough. Hence the benefit derived from subsoiling.

Let us now investigate the plan of applying it to the wheat stubble for the benefit of the ensuing crop of grass. The main disadvantage following this plan is that the corn receives no benefit from the lime, and the soil at the time the corn is growing contains more undecomposed vegetable matter than at any other time.

I do not like the application of lime to the corn crop, because I consider that it has a tendency to keep the oats green and to make the straw stiff and harsh, more like wheat straw, and I have always found that cattle do not relish it as well. Whether this objection will overbalance the advantages enumerated, I leave for others to judge.

There is a third plan which I think obviates the disadvantages of both systems. Let the manure, instead of being applied to the wheat, be spread on the sod and ploughed down deep for corn. When ploughing for oats, plough one-half as deep, say six inches, and avoid bringing the manure to the surface; it being thus buried and deprived of the influence of the atmosphere, will decompose but little.—In ploughing for wheat, plough deep *twice*, and this will thoroughly mix the manure with the soil.

Or, if you prefer it, give the corn a moderate coat of manure and treat as before, and in the fall give the wheat what was left in the yard (under shelter) and that which was collected and made during the summer.

The advantage of this plan may be thus set forth. The manure is hauled out early in the spring while there is leisure, and before the teams are fagged out with their summer's work. So long as the weather is cold, the manure will not suffer from the exposure, but some think it improves. It is ploughed in, and you thereby save the trouble of placing it under shelter, (which I take it for granted you do,) and also the loss, which, even with the very best care, must take place during

the summer. The corn does not take any more of the substance of the manure than would otherwise have evaporated during the summer.

By the time the ground is ready for wheat, the manure is decomposed and thoroughly mixed with the soil.

Between the two ploughings of wheat apply lime if you choose, but I prefer to apply it to the wheat stubble in the fall after the wheat is taken off, and pasture the next year and mow the ensuing one, when the lime will have its full effect upon the grass.

I throw out these ideas that all may think the matter over and see if they are pursuing the best course, and if not, adopt a better one, as has been the case with

J. P. H.

The Leaching of Soils.

There is one point of great interest in Dr. Voelcker's researches, which is highly suggestive, namely, that nitrate of soda—now used throughout Britain by thousands of tons annually—can only be applied in a profitable manner at one period of the growth of the crop, namely, just when the fibrous roots are hungry to supply the growing plant, and when the growing plant is ready to receive it. The salt must, during this period, be in a state of solution in the soil, and then the plant readily feeds upon it, and is greatly benefited, but if the nitrate of soda is sown during the first period of the growth of the crop, before the plant wants it, or is ready for it, and while the leaching operations of the rains of winter and spring are going on, the nitrate will be actually leached out of the soil and pass away and be lost in the escape water from the drains. So also if more is sown than the plant wants, or can assimilate, the nitrate does not remain in the soil like phosphates, and the amount of ammoniacal manure which unites naturally and chemically with the clay, but is lost, and is carried off by the waste moisture of the land.

If this is true of nitrate of soda, it may be that other matters which we so assiduously and at great expense apply to our soils, may be passing off, and becoming waste with the waste moisture of the land, while, for want of chemical examination, we have been ignorant of the fact. No one can examine too closely into these matters.—*Canada Farmer.*

Clover, the Great Renewer.

Since the delivery, by Professor Voelcker, of his celebrated lecture on this subject, (to which for a length of time we have given such prominence in the columns of the *Canada Farmer*), all the best English and Scottish Agricultural papers have gone extensively into the matter, and none more so than our respected contemporary, the *Farmer*, (Scottish,) which, in its issue of the 23d June, devotes three full columns to the subject. The old country agricultural papers are edited by a very superior class of writers, and reflect the public opinion of the most prominent agriculturists. "Scientific agriculture" has had a hard fight with practical agriculture throughout the three kingdoms, and it is only just now that the old-fashioned practical man begins to treat the scientific operator on farm land with anything like respect. In the article alluded to, the *Farmer* (Scottish) says: "Even so far back as the dawn of the present century, Lord Dundonald, ('the liberator of South America') struggled hard, fighting an up-hill battle with 'the powers that be,' to show the intimate connection between chemistry and agriculture. And how was he met? When intimating to one of the farmers of that day, who could see nothing good beyond the muck heap, that he looked forward to the time when an acre of ground would be manured effectively with a bag of artificial manure, 'Yes,' was the quaint and sneering rejoinder, 'and the produce carried to the stack-yard in your waistcoat pocket.' But the march of progress in agricultural science carried all before it. Sir Humphrey Davy gave a powerful impetus to calm investigation, and dozens of others have followed in his wake." In the first place, too much was expected from analysis of soils; and it was supposed that a farmer had only to take a small parcel of the land of his farm to the analyzer, and at once know what was wanted, and doubtless in most cases he received the most valuable information, and sound advice; but receiving alone is one thing and carrying such advice into operation is another. Many, if not most of the farmers of that early day had not knowledge enough to enable them to carry out the advice given, and the consequence was that they blamed the analyzer and the system on which he acted, naturally enough not blaming themselves.

Lord Dundonald was far too wise a man

to sneer at the "muck heap." All our trouble in Canada is, that we have not enough of it, and so if we cannot find some substitute we must go without, for our labor is so dear, and our prices so low, that artificial manures are (or are believed to be, which comes to much the same thing), beyond the reach of our ordinary farmers. We must therefore turn to what we have, and what all see they can afford, and in clover they have not only the "muck heap," but the muck heap and the bag of guano combined; for Voelcker says that a good crop of clover which has produced one heavy crop of hay, "and which has been allowed to stand for seed," (for this he insists on), will add to the land a fertility for wheat which could not be attained with the heaviest practical dressing of guano. But to do this in the best possible manner the clover must be allowed to come to perfection; must be treated so that it will produce, and leave on the ground the greatest possible amount of root and leaf, for in those portions of the plant consists the virtue of the clover crop. How much superior, therefore, must be the method, which has been advocated so often in these pages, to grow the clover in the greatest perfection by letting it grow during the entire year, and untouched by the eating down of cattle, and by the scythe. Let the entire proceeds of leaves and stems go to the soils, instead of leaving merely what leaf matter falls off in the growing and harvesting of a crop of seed. Encourage the root to make the greatest possible growth by leaving the stems to flourish and come to perfection. Allow the seed to fall on the ground to form the future plant, (for clover seed, when it remains in the original pod or seed case, will keep its vitality for a considerable period of time, certainly more than one year), then the following season allow the roots again to throw up the herbage and flower stems, and as soon as the plant is well in flower, plough all under together, and fallow for the wheat crop. We shall thus combine the "muck heap" and the "guano bag," and the proceeds will be, in all likelihood, a splendid crop of wheat, attained at the mere loss of one year's rent (or its equivalent), over and above the ordinary course of cutting the hay crop and feeding down the aftergrass. In the latter case you have the *seeming* profit of the hay, and the sheep and cattle, but you have also the expense of haying and carriage of manure back to

the field, and after all attain only an inferior crop of wheat, instead of having a first-rate one. The ordinary system certainly in time runs the land down; by the other a heavy crop of wheat is attainable every third year, with only one ploughing, and the cultivatings and harrowings necessary to keep the weeds down, and any one can see that under such treatment the land would attain a richness and heart, so much wanted, and so seldom found under present management.—*Canada Farmer.*

Steam Agriculture.

The following from the letter of a correspondent to an English agricultural paper, is worthy of more than a passing thought.—The public does not yet begin to comprehend the part which steam is now performing in the industries of the world. Much less the magnitude of its future.

"It is a fact," writes this correspondent, "that I am now harvesting my fourteenth crop under steam culture."

"It is a fact that Lots Nos. 1 and 4 heavy lands are bean-growing on seed beds costing only 7s. 3d. an acre; that they are strong in straw, well corned, free from fly or blight, and ripening well, unlike many a crop now growing upon shallow, horse-worked land, that may be seen to be weak in straw, full of fly, and dying a premature death."

"It is a fact that my Nos. 2 and 3 heavy lands are wheat-growing on seed beds costing only 6s. 9d. an acre; that they are strong in straw, full of corn, and ripen well; together they are the best I ever had on this land in my life."

"It is a fact that these four fields will give me an average of full 40 bushels per acre, and it is a fact that under horse culture (having a dead fallow every fourth year) they did not average over 20 bushels per acre, one year with another."

"The next fact to be looked to is, what do our best farmers on such soils get now-a-days under horse culture? Mr. Whitworth, of Wilton, a mile from here, is a good farmer under horse culture. He occupies three farms—one where he lives, one at Woughton, only a mile from here. To prove that he is a good farmer, let me tell you that he has made money by farming. Two years ago he bought with his earnings his Woughton farm, for over £11,000—therefore I need not say any more on that

point. On his Woughton farm he has six fields of ploughed land exactly in character with my heavy land, on the same hill, and within a mile of it. This year three of his fields are wheat, one beans, one vetches, fed on and fallowed for next year, and the other clover, fed on, and is now being fallowed for the next year. The worth of this feed for sheep, after paying all the expenses for seeding and shepherding, is but a mere trifle; I estimate it at 5s. per acre. Now, then, for the produce on the three fields of wheat and one of beans; it is not over 35 bushels per acre, or from an acre of each added together only 140 bushels. When divided by six, to spread the 140 bushels over the six fields, we find the average to be only $23\frac{1}{3}$ bushels per acre; to which must be added 1s. 6d. as a share of the value after payment of expenses for sheep-keep on the two fields of vetches and clover. I do not ask Mr. Whitworth's permission to make this statement, but I state it openly and fearlessly on behalf of steam culture against the best horse culture. Let him or any other man pull me back in the correctness of it if he can. I know that it is true, and I mean that the world shall know it. Had I taken bad farming for my comparison, the average would have been less than $23\frac{1}{3}$ bushels, with 1s. 6d. for sheep-keep to be added per acre, against my 40 bushels per acre.

"I ask you to publish these few facts to help me to open the eyes of landlords and farmers of England as to the use and value of steam power to culture, and in addition to what I have stated above, I will state here that my light land crops are excellent, without troubling you with particulars.

"I might have stated another fact, that this heavy land of mine always needed four good horses to plough it from 5 to 6 inches deep, which cost fully 14s. per acre; whereas by steam power I can now make an average seed bed for 7s. an acre year after year, and keep my land clean for corn crops every year."—*Western Farmer.*

A correspondent of the *Prairie Farmer*, traveling in Utah, represents the crops as unusually abundant. Yields of forty bushels per acre of wheat are spoken of; while those of oats and barley were never beaten. In the southern part of the territory cotton, madder, indigo, figs and pepper are produced.

Drying Sweet Potatoes.

We received last week, from Mr. Francis W. Smith, of Baltimore, a printed copy of his protest against the claim of Dr. C. K. Marshall to a patent for drying sweet potatoes.

While we do not pretend to arbitrate between the parties, we may be permitted to express our high appreciation of the invention, which we conceive to be of vastly greater importance to the whole agricultural community than would be supposed by those not familiar with the details. The potato grower at the South, and the cattle feeder at the North, are equally interested in the success of the new process.

Of all the tubers grown, the sweet potato yields the heaviest and most certain crops at the least cost of cultivation; under the patent in dispute it can be dried and ground into meal at a cost almost nominal, and being greatly reduced in bulk, and concentrated by the drying process, it will bear the cost of distant transportation, and will, we doubt not, eventually become the cheapest, as it is the best, winter food for dairy cattle and swine.

To Mr. Francis W. Smith the country owes the drying tunnel, a cheap contrivance by which twenty-five bushels of fruit or vegetables may be dried in twenty-four hours at a trifling cost.

The value of Mr. Smith's tunnel to fruit growers remote from market, or in bountiful seasons like the last, when from over-production the market for fresh fruit becomes glutted, is too apparent for comment. We know of thousands of acres in the mountains of Virginia—particularly in the Blue Ridge—covered with apple orchards, where the distilleries, being stopped by the excise law, the fruit is left to rot upon the ground. By the use of the patent apple-parer and Smith's tunnel, these orchards can be made more remunerative than when all the distilleries were in full blast.—*Turf, Field and Farm.*

POULTRY MANURE.—The productive power of the droppings of the henery is very great as compared with ordinary barnyard manure, yet many farmers, with a score or two of fowls, take little or no pains to preserve and apply it to the purposes of vegetable production. It is an excellent dressing for gardens, and will repay a hundred fold the care and expense of preserving and applying it.

Rotation of Crops.

On every farm there is usually raised at least some of the good old fashioned cereals, corn, wheat, oats, and also potatoes; and perhaps sufficient of these should *always* be grown for family and farm consumption and to avoid buying. They are not, however, always necessarily the staple crops from which the chief profits of the farm are derived; and it will be found that in every section and neighborhood almost, there are certain specialties particularly adapted to its cultivation, by reason of soil, distance from market, or other circumstances, which make the heavy end of the annual profits.

In the immediate vicinity of Philadelphia, for at least 30 to 40 miles round, convenient to railroads, the dairy business (milk and butter,) should undoubtedly be the *main* object—the raising of grain being merely incidental to it.

In many parts of New Jersey the staple crops are certainly small fruits and vegetables. In other places there would appear to be peculiar advantages for rearing improved breeds of live stock. We know of soils where wheat grows well, producing heavy crops with an alternation of clover, year after year. In some places, on a smooth road, hauling hay to a market like Philadelphia, and bringing a return load of manure, would appear to be profitable and a self-sustaining system. In other sections, packing or baling hay for transportation yields more money than any other crop.

It is very important for every farmer rightly to select his main staple crop. Whichever of these several plans is adopted, it should be borne in mind that generally only *one*, or at least *two*, can be well managed on a single farm. They cannot *all* succeed; and to try them all is sure to result in failure. It would be a kind of "Jack of all trades and master of none." Military men would call it covering too much ground, and exposing too much front. Weakness or want of driving *force* would result—labor being divided when it ought to be concentrated.

We will suppose a dairy farm where the object is to keep, summer and winter, the largest number of cows. Even if grain is purchased, it will be obviously inexpedient to buy grass or hay. The grass crop, therefore, should be the chief point of attention; and such a system is best for a dairy farm which

will bring about a luxuriant growth of nutritious grasses, and retain them *longest* without the necessity of ploughing up. Without grain, straw and corn-fodder, stock could not be kept, and without these there could be no manure; so that some ploughing and some cropping are indispensable.

We would suggest the following rotation in place of the present one: 1st, corn, to which all the manure should be applied, except what is wanted for potatoes; 2d year, seed with oats and barley mixed, and clover. Oats now is a very uncertain crop, and experiments the present season on the Experimental Farm in Chester county and elsewhere, seem to show these ripen well together (say two-thirds barley and one-third oats,) and are not so apt to fall down. As feed for cows the two grains mixed have been found more valuable than either alone. 3d year, clover to be ploughed down the next fall for wheat, which should be sown with grass seed in the usual way.—This makes a four years' rotation. The advantages are, first, there would undoubtedly be an average much heavier corn crop; second, there would be a far more valuable crop for milch cows than an oats crop alone usually is; third, as regards the value of the clover crop, which could partially be pastured, we refer to article in our last number by Dr. Voelcker. It is a great meliorator, improver and subsoiler, and if there is any one way to ensure a crop of wheat it is to precede it with a crop of clover. All experience, everywhere, proves this.

This rotation, besides being a practical one, is also based on sound theory. Corn is a gross feeder—and we have never heard of any land too rich for it. Barn-yard manure, in its only partially decomposed state in the spring, is exactly what it requires, to warm the soil and drive the corn ahead. While the ground might be left too rich for oats the next season, it would not be for barley or barley and oats combined. The third year, (unless the "laws of nature" are similar to what they are around Salem, New Jersey, where roots only run down five inches and then stop,) it would be found that clover would do what farmers hesitate about, it would subsoil, or extend its tap-roots down, opening the lower strata to the air, bringing up mineral plant food, and evolving chemical combinations there, besides making a mass of vegetable matter, to be turned down, exactly suitable

to the growth of wheat. We present this rotation for the consideration of our farmers, and should be glad to have their views of it.
—*Practical Farmer.*

Liebig's Extract of Meat.

Chemistry has ceased to be the tool of the visionary or solely the handmaid of science, strictly so called. It has risen to the demands of the kitchen, and has entered the precincts of the cook, and with her apparatus and reagents is shedding light and knowledge on the processes and combinations on which millions depend for happiness and health.

The department of cookery has been left to the management of the most ignorant, and combinations, conditions and materials are brought to our tables as unnatural, and consequently as hurtful as well could be.

The chemist has seen this condition of things for a long time; but the chemist was not a cook, nor the cook a chemist; hence no relief to suffering humanity was achieved. But the scene is changing. The profoundest philosopher and the expertist chemist is devoting his great powers to the correction of the great and fatal defects in the dietetics of society. The world owes much to the labors of Baron Liebig, and perhaps for no one thing more than for his *Extractum Carnis*—extract of meat. This is the pure nutritive part of meat, divested of all other materials. It is concentrated fibrin, albumen and phosphates. We can conceive of nothing more perfectly nutritious. To the young and the convalescent it must be of the highest importance. In cases of weak digestion it lays the least possible tax on the digestive powers of the stomach. When crude food would be hurtful or useless, this *Extract* may be digested and assimilated with greatly invigorating effects. In soups it must be of great value.

We have before us a specimen from J. Milhau's Sons, No. 183 Broadway, who, we believe, are the agents for the United States. It is neatly put up in stoneware jars, and fully protected from the action of external agents. It ought to be on the shelf of every retail grocer.

This *Extract* is manufactured in South America, on the River Uruguay, by a London company, under the management of a representative of Baron Liebig, Dr. Seekamo.—Four hundred beeves are worked up each day.
—*Am. Grocer.*

Mules or Horses?

No sensible farmer will deny that mules have some few advantages over horses. Then why not use mules instead of horses? When will they make the change? I answer when they prefer utility, interest and a just taste to a diseased fancy. I know many farmers who would be ashamed to be caught riding in a carriage behind a pair of mules; and why? Is it because a mule has longer ears or smaller feet than a horse? I think it proceeds from a species of false pride. For although I admit that a good horse looks better than nine-tenths of the mules we see, yet I deny that a bad horse looks better than a good mule. And why is it that our horses look so much better than most of our mules? The reason is this—our farmers have a false notion that it is not necessary that a mule should be kept clean, therefore they always look rough and dirty. My belief is that if a mule had the same attention in every respect that is usually bestowed on a horse, he will look as well and in fact will out-look and out-work most horses of any breed.

But there are several other items besides appearance to be taken into consideration.

From the report of an agricultural committee in South Carolina, in the year 1824, I quote the following: "The annual expenses of keeping a horse is equal to his value. A horse at four years old will not bring much more than his cost. Two mules can be raised at a less expense than one horse (?) The mule is fit for labor earlier, and if of sufficient size will perform as much labor as a horse; and if attended to when first put to work, his gait and his habits may be formed to suit his owner."

I am convinced that a pair of mules may be kept in good condition, and do all the work usually required of a pair of horses on a farm, on three-fourths the hay and one-half the grain that would usually be fed to a pair of horses doing the same work.

The expense of shoeing a mule the year round is not more than one-third that of the horse; his hoofs being harder and more horny and so slow of growth, that the shoes require no removal, but hold till worn-out; and the wear, from the lightness of the animal, is much less.

They are always found to be truer pullers and quicker travelers with a load than horses—they are more steady in their draught than horses, and are less likely to waste their

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strength, and therefore are more suitable to work before oxen. In hoe-harrowing, his feet being smaller and following each other more nearly in a line, he is not so likely to tread on the corn.

The longevity of the mule is proverbial. Pliny mentions one eighty years old; De Russ saw two in England which were seventy years old. Therefore the owner of the mule may reasonably look for the continuance of his mule capital for thirty years, while at the end of fifteen years the owner of the horse must look to his crops or his bank for renewing his. A correspondent of the Baltimore *Patriot* asserts that "Col. John E. Howard had a pair of mules that worked thirty years, after which they were sold to a carter in the city, and performed as hard service for several years longer."

After so much said about mules, it will be deemed folly, by some, to ask the question, what is a mule? The answer will, nine times out of ten, be, "a hybrid between the horse and the ass." Yet this is not exactly correct, for a hybrid between the horse and ass will produce two distinct races of animals, as different from one another as a horse is different from a mule. One of these, the offspring of the male horse or stallion and the female ass, is the hinny, (from the Latin *hinuus*, the derivative of the word *hinnire*, to neigh.) This animal is characteristic of the horse, which he closely resembles in many qualities; but he also inherits the hardy constitution and activity of his mother, the ass. One distinguishing feature of the hinny is that he neighs like a horse, and his ears are smaller and his feet larger than the mule proper. In every respect he partakes more of the character of the horse than the ass. The second hybrid between the male ass or jack and the female horse or mare, is the mule, (from the Latin *hemionus*, or half-ass.) This hybrid takes after his sire, as in the case of the former hybrid. I have never had any experience with the hinny, but have heard it said they were preferable to the mule for pleasure traveling, but not for heavy draught. Can any of the many readers of the *Telegraph* give us light upon this subject? I should be glad to have it.

My belief is, that if a pair of mule colts were taken at weaning and brought up similar in every way to a pair of horses, they (the mules) would be much preferable for common farm work, and quite as good for road travel-

ing. But we often see farmers keeping six or eight horses; why not change them for as many mules? Or if too proud to ride behind a pair of mules, why not exchange six of the eight for as many mules? Why cannot our farmers raise mules more than they do?

But if we are to take the opinion of De Denyon, the celebrated French physiologist, as a guide, we must be careful what mares we use for one thing. No amount of blood on the part of the dam will improve the mule; for whether the mare be common dunghill breed, or as thorough-bred as Spiletta, the mother of Eclipse, the offspring is still a mule of the same ass type. De Denyon tells us that a mare which has once borne a hybrid becomes herself a hybrid, and can never bear a perfect animal of her own race afterward. Imagine our faces, then, if we stint such mares as Grey Eagle, Wagner, Lilly Dale or Sallie Grey, to common jacks, and afterward breed them to a Revenue, a Lexington, a Monarch, or a Sweeper, and find the progeny on its appearance to be a long-eared mule with a stripe along its back and a bar across its shoulders! Have any of the readers of the *Telegraph*, or can the editor give us any reliable data on this point? De Denyon's comes from too far off. After all, the greatest part of our valuable knowledge comes from the experience of others. This is at least the case with me.—*Cor. Ger. Telegraph.*

Poppy raising and opium manufacture is likely to become an important branch of industry in Addison county, Vermont. Last year a man in Moncton raised poppies and manufactured opium to the value of \$3,000, and a number of farmers propose this year to cultivate the plant quite extensively.—There are to be several acres of poppies on one farm in East Middlebury.

Mr. J. Harris says in the *Agriculturist* that he does not know how he could get along without petroleum. He keeps the wood work of his farm tools and implements saturated with it, to keep the rain, sun and air from swelling and shrinking and ruining them.

The grass should not be allowed to grow around young trees after being planted, as it stunts their growth and utterly ruins them. The ground should be kept clean and loose around them, until, at least, they are of bearing size.

SUNDAY READING.

God's Gift of Corn; A Sermon for Harvest-Tide.

"Thou crownest the year with Thy goodness; and Thy paths drop fatness. They drop upon the pastures of the wilderness: and the little hills rejoice on every side. The pastures are clothed with flocks; the valleys also are covered over with corn: they shout for joy, they also sing."—PSALM LXX. 11—13.

In this sixty-fifth Psalm David is praising God as the Creator and Lord of the world of nature. It is one into the thoughts and feelings of which we may be well able to enter just at this time. For nearly half of the Psalm is taken up with one particular part of God's goodness in the world of nature—His gift of the fruits of the earth. You will remember, indeed, that David and his people had special cause to worship and bless God on their account; because the fruitfulness of their land, year by year, was a continual memorial of the covenant which He had made with them, and depended closely upon their loving and obeying Him. Before they entered into the land of Canaan Moses had told them about this; he had told them that it was a land of hills and valleys, which drank water of the rains of heaven; a land for which the Lord their God cared, and on which His eyes always rested from the beginning of the year even unto the end of the year. By which he meant that the land of Canaan depended entirely upon regular and seasonable supplies of rain for its fruitfulness. It was not a land to which God had given, as He had to others, plentiful waters of its own; nor one which men could keep well watered, as the Egyptians could their land; but it was a land which more *closely* and *plainly* than any other depended upon God's own special care and watchfulness from year's end to year's end; and so would make its people remember more how dependent they were upon God, and how much they owed Him; so that they would say with deep feeling as David says in this Psalm, "Thou visitest the earth, and waterest it: Thou greatly enrichest it with the river of God, which is full of water. Thou waterest the ridges thereof abundantly: Thou settlest the furrows thereof: Thou makest it soft with showers: Thou blessest the increase of it."

We, too, are being reminded now of our dependence upon God's unwearying love and

bounty as the Creator and Master of all the powers and operations of nature. So we may find much profit, if we take up some thoughts about God's great gift of corn, and see what lessons it may teach us about God's goodness to us, body and soul. I hope we may learn to feel that the corn has more and greater thoughts to give us than we often think; and that in a true sense the corn-fields are, as one* has called them, "holy ground."

1. Our first thought shall be a simple one. When we stand looking upon the yellow fields, or watching the reapers, we know we are looking upon a sight which the summer sun has shone down upon every year since the world began; whatever else has changed in the world's 6,000 years of life, the sights and sounds of the corn-fields have little or nothing changed. They are the same as they were when Cain and his brother tilled the ground and gathered in their harvests; or as when Ruth gleaned after the reapers of Boaz in the fields of Bethlehem; or as when our Lord, sitting at the well of Sychar, bade His disciples lift up their eyes and behold the fields white already to harvest. So it has been, so it is all the world over. And may not this help us somewhat to realize those words of St. Paul, that "God hath made of one blood all nations of men for to dwell upon all the face of the earth?" and to feel that all mankind, now and in all times past, form one great family of God's children, all alike depending upon His hand, all alike waiting for Him to give and preserve them "life and breath and all things?" So that there is in the words, and should be in our hearts, a meaning wide as the world, when we pray, "Our Father, which art in heaven, give us this day our daily bread."

(To be continued.)

Sheep are of a very harmless and inoffensive nature. "What the dove is among birds, the same is the sheep among cattle." And such must Christians be, indued with dove-like simplicity, with lamb-like innocence.

Objections against *Christianity* as contradistinguished from objections against its *evidences* are frivolous,

* See the Rev. H. Macmillan's "Bible Teachings in Nature," from which the following thoughts are taken, except the fourth.

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A Clergyman, while residing in South America as missionary, discovered a safe and simple remedy for the Cure of Nervous Weakness, Early Decay, Disease of the Urinary and Seminal Organs, and the whole train of disorders brought on by baneful and vicious habits. Great numbers have been cured by this noble remedy. Prompted by a desire to benefit the afflicted and unfortunate, I will send the recipe for preparing and using this medicine, in a sealed envelope, to any one who needs it, *Free of Charge.*

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We are now prepared to fill orders more promptly than during the past year and a half; having at great cost and care in selection, increased our Breeding Stock of

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To a capacity that will enable us to supply our customers at shorter notice. We also have the finest stock of

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And warranted both to be pure and as good as any offered. Send for circular of prices and instructions necessary for the management of Swine. Fine Brahma and other improved fowls at reasonable rates. We cordially solicit your patronage

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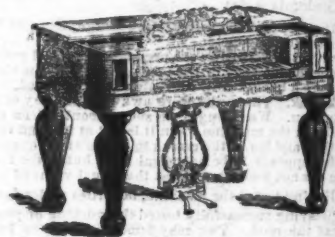
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This is, without question, the best family knitting-machine ever invented. It is small, light, neat, simple of construction, durable, works very rapidly, *has but one needle,* makes the old-fashioned knitting-needle stitch (and two others,) with light or heavy, single or double yarn, *sets up and finishes its own work,* and needs no weights. It knits close or loose textures, hollow or flat web, large or small fabrics,—anything that can be knit by hand, and in a much better manner. A child can readily operate it, and can learn to do so much sooner than to knit with ordinary needles. There is nothing to be done but to thread a needle and turn a crank, until the heel is reached, which is formed to perfection, with little trouble and no sewing: the same is the case with the toe.

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I am breeding thorough bred Horses, the Imported Percheron Norman Horses, and the Black Hawk Branch of the Morgan Stock, for sale. Also Pure bred Short Horn Cattle, Chester White and Albemarle Improved Swine, (the latter a cross of Woburn and Chester Whites,) and Brahma Fowls for sale.

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Houdans, Sup. Imp. Brahmas, unsurpassed, weigh 28 lbs. per pair at maturity, Hamburgs, White Leghorns, and Black Spanish, not excelled in the U. S.

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Of our own growth, and warranted genuine—from one pound to 100 barrels. Inducements offered, if taken this fall.

Prices given on application.

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WESTINGHOUSE THRESHERS and CLEANERS,
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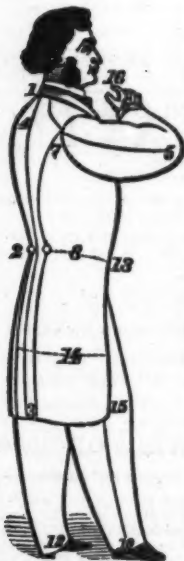
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The well known VAN WICKLE WHEAT FANS,
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Fresh and Genuine FIELD and GARDEN SEEDS.
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COAT.

Length.....	from 1 to 2 and 3	Around the Waist under the Coat.....	ft
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Around the Breast under the Coat.....	7	Weight.....	lbs.

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Length, from 1 to 13, with last two Coat Measures.

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Outside Seam from top of Waistband...10	Around the Waist under the Coat.....	ft
Inside Leg Seam from Crotch.....12	Around the Hips under the Coat.....	in

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Around the Neck under Cravat, 16, with all the Coat Measures.

Gentlemen at a distance can order their Clothing by the above system of measurement, which can be taken by any one, whether a tailor or not. All orders will have prompt and careful attention, and be filled with strict reference to the well-earned reputation of the House for **TASTEFUL and SUBSTANTIAL** Clothing. Prices guaranteed to be lower than Merchant Tailoring Establishments generally. Samples of Materials, with prices sent by mail, when desired.

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These instruments have won their way to public confidence on the strength of their

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This Manure contains all the elements to produce large crops of all kinds, and is highly recommended by all who used it, also by distinguished chemists who have, by analysis, tested its qualities.

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ADAPTED FOR

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Strawberry, Raspberry and Blackberry Plants,
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This *Reaper* took the Gold Medal at the Great Field Trial held at *Auburn, N. Y.*, in July, 1868,
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This Mower we can recommend as the best in use.

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HORSE POWERS, all the different patterns and sizes,

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**GRAIN CRADLES, with iron brace, our own make. WHEAT and GUANO DRILLS, PLOWS,
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The above named Machines are our own manufacture, and such as we can recommend with confidence to our friends and customers.

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NURSERYMEN AND SEEDSMEN,
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Offer the present season a full and complete stock, in both NURSERY and SEED DEPARTMENTS.
PRICED LIST OF FRUIT and ORNAMENTAL TREES and PLANTS, SMALL FRUITS, &c.,
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DESCRIPTIVE PRICED LIST OF CHOICE SEED WHEATS, OATS, POTATOES, &c.

ILLUSTRATED CATALOGUE OF GARDEN AND FLOWER SEEDS FOR 1870, *will be duly mailed our customers (and others desiring it,) about January 1st, next.*

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